The University of Alberta

Monitoring Psychological Variables in an Elite Competitive Swimmer Across a Season: An Application of the IZOF Model

By

©

Fahreen Rayani

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree Master of Arts

Faculty of Physical Education and Recreation

Edmonton, Alberta
Spring 2004

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Abstract

This case study had two purposes: (1) to extend the IZOF model to include various psychological constructs (i.e., anxiety, confidence, concentration, motivation, recovery-stress, and mood states) utilizing a multidimensional approach to describe the phenomena; and (2) to develop an athlete-generated checklist to identify and establish an athlete's personal psychological performance profile. The participant in this study was an elite competitive female swimmer (17 yrs. old) who completed ten self-report measures (SAS, CASS, SMS, RESTQ-Sport, CSCI, CSAI-2, POMS, MSRS, AGI, MRF) on 16 separate occasions throughout 2 macro cycles of her competitive swim season (September 2002-March 2003). Two interviews were conducted during this time; one at the beginning of the season to create a specific athlete-generated checklist and one at the end of the season to tease out the swimmer's personal reflections regarding her performance process and outcome throughout her season. An individual and unique performance profile of the swimmer was generated which included anxiety, confidence, concentration, motivation, recovery-stress, and mood states related to performance outcome. Results indicate that this athlete required low levels of cognitive anxiety, low to moderately-high levels of somatic anxiety, moderate to high levels of confidence, and high levels of concentration and motivation in the pre performance setting in order to increase the probability of a successful short course swimming performance. In addition to this athlete's profile, factors such as type and importance of swim meet, as well as, various social and environmental factors affected her overall performances across the season. This type of research has the potential to open doors to performance refinement through monitoring and profiling psychological states, thus allowing for athletes to

engage in self-regulation and ultimately increase the likelihood of performance consistency and control.

Acknowledgements

I would like to thank the coaching staff and the athletes at the local swim club for their time and willingness to be apart of this research. To Lisa Rogerson for her time and exceptionally helpful and informative comments, Karim Rayani for all his time and patience, and Dr. Brian Nielson and Dr. Graham Fishburne for their support and direction. As well, my deep appreciation goes to Dr. John Hogg, my mentor, for providing me with this opportunity and offering me his unconditional guidance, wisdom, and support.

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List of Abbreviations

AGI	Athlete-Generated Instrument
CASS	Causes of Anxiety in Sport Scale
CSAI-2	Competitive State Anxiety Inventory-2
CSCI	Carolina Sport Confidence Inventory
IZOF	Individual Zones of Optimal Functioning
ME	Magnitude Estimation
MRF	Mental Readiness Form
MSRS	Mental States of Readiness and Satisfaction
NCAA	National Collegiate Athletic Association
POMS	Profile of Mood States
PSTP	Psychological Skills Training Program
RESTQ	Rest and Recovery Questionnaire
SAS	Sport Anxiety Scale
SMS	Sport Motivation Scale
SNC	Swimming Natation Canada
STAI	State Anxiety Inventory
ZOF	Zones of Optimal Functioning

CHAPTER 1

There are intriguing questions that constantly arise related to each athlete's ideal performance state. For example: (1) What makes an athlete persist and keep performing consistently well at the highest possible level and under a variety of difficult and ever changing conditions? (2) Is there something about the athlete's psychological make-up (personality, attitude, competitive hardiness, mental toughness, etc.) that makes the consistent and controlled performer better? (3) Is the elite athlete able to harness his/her mental and emotional resources more effectively to ensure optimal levels of motivation or activation? Obviously an in depth and detailed case study focusing on the technical, tactical, physical, and especially the mental and emotional aspects of an athlete's performance over time would yield critical information that would guide both program planning and effective coping responses.

Hogg (1997a, 2000) has presented a model of mental preparation that addresses the teaching of basic mental skills, the creation of ideal performance states, and the harnessing of the sport-related emotions. This model, as yet untested, adopts a cognitive-behavioral, systematic, and interactive approach in the presentation of its content. Much of the focus of existing mental preparation programs is on the conceptual understanding of major psychological constructs (anxiety, confidence, concentration, and motivation), and on the teaching and integration of these skills into the training and competitive environments (Mahoney, Gabriel, & Perkins, 1987). However, the remaining three components of the systematized model - namely, monitoring, evaluating, and refining performance - are relatively untouched.

The importance of individually monitoring within a competitive sporting environment not only affects how individual athletes set performance expectations, but also how confident they feel in their probability of success. Thus, monitoring increases both self-awareness and confidence, as well as, the performance of a given task no matter the complexity (Behncke, 2002; Kim, 1999; Kim & Cho, 1996).

Possibly, there is an advantage to monitoring those psychological aspects of performance that have the influencing powers to facilitate or debilitate the athletes' efforts. To be able to do this repeatedly over time and within a relevant theoretical framework is likely more beneficial than a random approach. Any framework must be comprehensive and sufficiently refined to be easily and directly applicable to the selected sport in the broadest of contexts. There are several existing models that attempt to examine the performance-activation relationship that have received attention in the sport psychology literature. Most recently both catastrophe theory (Hardy, 1990, 1996) and reversal theory (Kerr, 1985, 1997) although complicated show promise. However, Hanin's (1995) Individual Zones of Optimal Functioning model (IZOF) has proved to be of particular interest to the sport practitioner. This model is derived from Hanin's social psychological perspective of the anxiety-performance relationship that encourages the use of repeated measures to profile an athlete's performance preferences in striving toward ideal performance states and enhancing the likelihood of performance consistency and control. "The IZOF model serves as a framework for qualitative and quantitative analysis of the structure and function of emotional experiences related to a successful or poor performance" (Hanin, 2000, p. 65). The critical tenet of this model posits that athletes have an optimal zone or range of emotional states that possibly facilitate or debilitate their performance levels. It is assumed that this zone or bandwidth is highly individualized and that each athlete has a unique optimal intensity level (low, moderate, or high). Performance success then relates to whether the emotional state is near to, within, or outside this zone. Advantages of the IZOF model are clear: it is intuitively appealing, practical, a diagnostic tool, easily manageable, operated by the athlete, and relatively precise in indicating and predicting optimum performance states.

The attractiveness of the IZOF model lies in its multidimensional approach to describing performance related psychobiosocial states. Utilizing this framework makes it possible to not only achieve a more complete picture of the performance phenomena, but it also takes into account factors that affect the individual performance process as well as the outcome. The model encompasses five basic dimensions: form, intensity, content, time, and context (Hanin, 2000).

The form dimension describes how a phenomenon is manifested, that is, the way a phenomenon presents itself in the competitive sporting environment. The conceptualization of the psychobiosocial state originates within this dimension. The model suggests seven basic forms of the performance state which include: cognitive, affective, motivational, bodily-somatic, motor-behavioral, performance, and communicative aspects. The cognitive, affective, and motivational forms illustrate the psychological aspect of performance; the bodily-somatic and motor-behavioral forms illustrate the biological or psychophysiological aspects of performance; and the performance and communicative forms represent the observable social interactions with the environment. Common and typical forms of cognitive and somatic anxiety displayed in the competitive swimming environment although unique to each swimmer, usually are found in the forms of self-doubt, negative self-talk, feelings of queasiness ("butterflies"), and increased heart rate.

The content dimension is the informational dimension where the performance state may be described as positive-negative, optimal-non optimal, facilitative-debilitative, or task relevant-irrelevant through qualitative methods. As the IZOF model emphasizes an individualized approach, within the sport of swimming, a particular swimmer may perceive his/her somatic anxiety symptoms prior to performance as negative and debilitative to performance, whereas, another swimmer may perceive his/her somatic anxiety symptoms as positive and facilitative to performance.

The intensity dimension is the quantitative aspect of the psychobiosocial state where the IZOF model ultimately generates a profile with the expectation of performance outcome resulting from the zones created using the content and intensity of the performance state. Specifically, the probability that an athlete will have a successful performance is higher when the current intensity of the psychological state of an athlete is closer to the optimal zone that has already been developed. On the other hand, the farther away the psychological state is from the optimal zone, the higher the probability of a less desirable outcome (Hanin, 2000). For example, in the competitive swimming environment, one swimmer may require moderate levels of somatic anxiety prior to performance in order to increase the probability of a successful performance, while another swimmer may require low levels of somatic anxiety to achieve a successful performance.

The time dimension describes the psychological state in the pre, during, and post performance settings. This dimension takes into account the type of task in terms of short or long duration as well as single or repeated performances. Within the sport of swimming, events vary in terms of length and duration (e.g., 50m, 100m, 200m, 400m freestyle) and the number of times the event is swum on a particular race day (e.g., qualifying during a heat swim for a final swim). As such, psychological states prior to, during, and post performance can definitely differ in regards to intensity and form and may ultimately impact performance outcome. Further, individual differences must be factored into this dimension.

The fifth and last dimension of context involves responses to environmental factors and takes into account situational factors such as practice/training versus competition. For example, a competitive swimmer may find his/her anxiety levels quite low across practice/training environments whereas across competitions, find anxiety as a factor affecting performance positively or negatively. Perhaps this may be due to the uncertainty of the situation as well as uncertainty of performance outcome. In the sport of swimming, context plays a significant role because swim meets can be categorized into major competitions (e.g., nationals, Pan Ams, Commonwealth, Olympics) and minor competitions (e.g., provincial, club). According to the type of competition, an athlete's responses to the environment can vary from one extreme to the other.

The application of the individual zones of optimal functioning model (IZOF), which is an extension of the earlier ZOF model (Hanin, 1978), has been effectively used to study the anxiety-performance relationship (Annesi, 1997, 1998; Davis & Cox, 2002; Krane, 1993), mood states (Prapavessis & Grove, 1991), and more recently positive and negative affect (Hanin & Syrja, 1995, 1996).

Further support for the IZOF model in the sport psychology literature has been found in many other sporting environments with varying degrees of significance; for example women's soccer (Krane, 1993) and field hockey (Annesi, 1997), men's soccer (Hanin, 1995; Hanin & Syrja, 1996; Robazza, Bartoli, Nocini, Moser, & Arslan, 2000), volleyball (Robazza et al., 2000), basketball and football (Russell, 2000), and ice hockey (Hanin & Syrja, 1995). Within individual sports, the IZOF model has been applied to clay target shooters (Prapavessis & Grove, 1991), track and field (Harger & Raglin, 1994), and rifleshooting (Konttinen & Lyytinen, 1993).

The recent movement to repeated measures of multiple emotional states and their effect on performance is strongly supported by Hanin's (1995) model which asserts that state prior to competition could enable a customized mental training intervention to be created and applied. This in turn might allow the athlete to move more readily into his/her zone of optimal functioning and facilitate peak performance on a more consistent basis.

Purpose

The current study had four purposes:

1. To extend the application of the IZOF model to include various psychological constructs (i.e., anxiety, confidence, concentration, motivation, recovery-stress, and mood states) and utilize a multidimensional approach to describe these phenomena an elite swimmer was monitored over a sis month competitive season using repeated measures. Through the use of existing psychometric measures namely, Competitive State Anxiety Inventory-2 (Martens, Burton, Vealey, Bump, & Smith, 1990); Sport Anxiety Scale (Smith, Smoll, & Schutz, 1990); Causes of Anxiety in Sport Scale (Marchant, Anderson, Karnilowicz, & Stoove, 1997); Mental Readiness Form (Murphy, Greenspan,

performance equation. The equation used was soccer performance = successful passes - loss of possession – fouls + gain of possession + 2(shots on goal) + shots off goal - attempted heads + successful heads + assists + goals + 10. The higher the score, the better the performance was judged to be.

Researchers consistently agree that the emotions of elite and non-elite athletes are not limited to anxiety, anger, or depression (Crocker, 1992; Gould & Tuffy, 1996; Hardy, 1996; Prapavessis & Grove, 1991) and that the IZOF model has the potential to measure many other emotions and psychological constructs related to performance. The IZOF model can focus on various emotions in pre, during, and post performance conditions. Although the research has tended to focus on pre-competition anxiety states in the first instance (Annesi, 1997, 1998; Davis & Cox, 2002; Krane, 1993; Raglin, Morgan, & Wise, 1990), there are significant others (confidence, concentration, and motivation) that are just as critical as anxiety that need to be regularly monitored (Hanin, 2000; Taylor, 1995).

This study attempted to extend the IZOF principles to generate a more complete psychological profile of an elite competitive swimmer. A profile was created consisting of the following major psychological constructs: anxiety, confidence, concentration, motivation, recovery-stress, and mood states. In order to generate the individual profile, an elite swimmer was monitored over a sis month competitive season using repeated measures. Through the use of existing psychometric measures namely, Competitive State Anxiety Inventory-2 (Martens, Burton, Vealey, Bump, & Smith, 1990); Sport Anxiety Scale (Smith, Smoll, & Schutz, 1990); Causes of Anxiety in Sport Scale (Marchant, Anderson, Karnilowicz, & Stoove, 1997); Mental Readiness Form (Murphy, Greenspan, Jowdy, & Tammen, 1989); Carolina Sport Confidence Inventory (Manzo, Silva, & Mink, 2001); Sport Motivation Scale (Pelletier, Fortier, Vallerand, Tuson, Briere, & Blais, 1995); Rest and Recovery Questionnaire for Athletes (Kellmann & Kallus, 2001); Profile of Mood States (Grove & Prapavessis, 1992); Mental States of Readiness and Satisfaction Form (Hogg, 2002), athlete-generated measures, and interview procedures, it was possible to establish the athlete's ideal levels of activation for each psychological construct identified as well as accounting for environmental and social factors that would be conducive for a successful performance.

Identifying a comprehensive individual profile was necessary and helpful to ensure consistent peak performance. For example, knowing the athlete's psychological instance (Annesi, 1997, 1998; Davis & Cox, 2002; Krane, 1993; Raglin, Morgan, & Wise, 1990), there are significant others (confidence, concentration, and motivation) that are just as critical as anxiety that need to be regularly monitored (Hanin, 2000; Taylor, 1995).

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However, a study examining sport motivation and elite Bulgarian athletes (N=98), the researchers found that title and medal holders displayed higher levels of non-self-

3. To use both qualitative and quantitative approaches to understand the mental/emotional experiences of an athlete through profiling and monitoring across a competitive swim season (September 2002–March 2003).
4. To monitor the performance process and outcome through the use of repeated measures of select psychological constructs and specific behavioral observations and dialogue across a competitive swim season in order to obtain knowledge regarding the athlete's mental and emotional patterns and tendencies in the pre, during, and post performance settings.

CHAPTER 2

Review of Literature

Applied sport psychology is primarily concerned with the select psychological factors that tend to influence both the functioning and dysfunctioning of performance. Factors such as anxiety, confidence, concentration, and motivation have been recognized as critical and influential in sport performance (Mahoney & Avener, 1977; Mahoney et al., 1987; Nordell & Sime, 1993).

The following review of literature will: (1) briefly examine each psychological construct; (2) provide a conceptual understanding of the construct including operational definitions; and (3) briefly examine each construct in the general sport and swimming-specific literature.

Anxiety

At the forefront of sport performance research is the multidimensional construct of competitive anxiety. The multidimensional approach to anxiety reflects the influence of both somatic anxiety and cognitive anxiety. Somatic anxiety relates to physiological responses to the situation and can be characterized by increased heart rate, breathing rate, or feelings of uneasiness sometimes referred to as the "butterflies". Cognitive anxiety relates to a mental response that can be characterized by worry, self-doubt, feelings of anticipated success, and confidence (Jones & Swain, 1995; Jones, Swain & Hardy, 1993; Spielberger, 1971). Jones (1995a) provides a significant review of the anxiety literature and supports the viewpoint that cognitive anxiety tends to remain relatively stable whereas somatic anxiety increases quite rapidly as the competition approaches. In addition, he identifies antecedents of competitive anxiety as those related to the athlete's expectation of success in the sport task. For example, the perception of one's ability as well as the perception of one's opponent. Several antecedents for cognitive anxiety have also been hypothesized to be similar for the construct of self-confidence regarding performance expectations. For example, in a study by Jones, Swain, and Cale (1991) of male (N=28) and female (N=28) university athletes, sources of anxiety and self-confidence in female runners were associated with personal goals and standards, while the sources in male runners were associated with interpersonal comparison and winning. The antecedents for somatic anxiety are related to responses to stimuli; for example, changing room preparation and pre-competition warm-up routines, and tend to be non-evaluative and shorter in time compared to those of cognitive anxiety.

Anxiety Research in Sport. Current literature related to the anxiety-performance relationship has challenged the traditional assumption that elevated competitive anxiety levels are debilitating toward performance and suggests that elevated competitive anxiety states can indeed facilitate successful performance outcomes (Hanton & Jones, 1999a, 1999b; Jones, 1995a; Jones & Swain, 1995). In addition to this debilitative-facilitative dimension the notion of direction of anxiety has been addressed (Jones & Swain, 1992; Wiggins, 1998). Direction refers to assessing how sport performers perceive their physical states of competitive anxiety (somatic) and/or their mental states (cognitive) on a debilitative/facilitative continuum (i.e., whether their states are a help or a hindrance to performance) (Jones, 1995a; Jones & Swain, 1995). This continuum opens doors to further investigate the competitive anxiety-performance relationship regarding whether or not there are positive or negative performance implications. Jones et al. (1993) propose that an increase in cognitive anxiety (up to a particular intensity level) could possibly help and improve performance in select individuals by boosting motivation and attentional focus. On the other hand, some individuals' performance success may be decreased by irrelevant distractions.

Anxiety Research in Swimming. Support for the direction dimension of anxiety has been provided in several swimming - performance investigations. Jones, Hanton, and Swain (1994), despite finding no differences in a sample of elite versus non - elite swimmers in the intensity for both cognitive and somatic anxiety states one hour prior to an important race, the elite performers were found to view both somatic and cognitive anxiety states as more facilitating to performance. Jones and Hanton (1996) sampled elite competitive swimmers (N=91) and found that the direction of their anxiety was a better predictor of performance than intensity levels of either cognitive or somatic anxiety states. Specifically, swimmers that participated in an important competition with positive expectations reported both cognitive and somatic anxiety as facilitative versus those swimmers that had negative expectations. Recently, Hanton and Jones (1999a) examined the acquisition of cognitive skills and strategies that enable male elite competitive swimmers (N=10) to interpret anxiety symptoms as facilitative. The subjects reported negative experiences associated with pre-race anxiety when they were young (e.g., amount of training, simply performing, letting the team down, and making mistakes), but learned that precompetitive nerves could have positive effects on performance. In addition, they developed and integrated refined pre-competition routines that maintained facilitative perceptions of their competitive anxiety symptoms.

Both the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens et al., 1990) and The Sport Anxiety Scale (SAS) (Smith et al., 1990) have encouraged a multidimensional assessment of trait competitive anxiety. These instruments enable investigations of hypotheses related to competitive state and trait anxiety and their effect on performance. For example, Burton (1988) studied anxiety among competitive swimmers and found that cognitive worry more directly impairs performance than somatic anxiety and provided added construct validity for the CSAI-2 instrument; which purports to measure cognitive anxiety, somatic anxiety, and confidence. Previous research applying the early ZOF model (Hanin, 1978) to investigate the anxiety-performance relationship frequently utilized the CSAI-2 instrument (Krane, 1993; Scallen, 1993).

A recent application of the IZOF model to the sport of swimming has been provided by Davis and Cox (2002). Using a sample of swimmers (N=21), the researchers used repeated measures of the CSAI-2 (N=~14) to find support for the IZOF model as it relates to cognitive anxiety. Specifically, performance outcomes in swimming were better when the intensity of cognitive anxiety fell within the zone of optimal functioning; whereas poor swimming performances occurred when cognitive anxiety levels were outside the zone of optimal functioning.

Although research applying the IZOF model to anxiety and swimming is scarce, early research utilizing the ZOF model to study anxiety within the sport of swimming does exist. Raglin et al. (1990) tested the ZOF model (Hanin, 1978) with female high school swimmers (N=15) using three different methods: The State Anxiety Inventory (STAI) (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), recall of optimal pre competition anxiety states, and prediction one day prior to racing, how they would feel one hour prior to racing. Results supported the ZOF model in that for those swimmers who experienced successful outcomes, accurately predicted their pre competition anxiety one hour prior to racing and had pre competition anxiety levels that were closer to their recall of optimal pre competition anxiety. They also revealed that prior to difficult meets versus easy meets, pre competition anxiety increased. In a similar study, Raglin, Wise, and Morgan (1990) studied the ability of female high school swimmers (N=17) to predict pre competition anxiety using the ZOF model (Hanin, 1978). In support of the previous study, the researchers found that pre competition anxiety increased prior to difficult meets, but not easy meets and a correlation was found between predicted and actual pre competition anxiety. In other words, younger athletes are also capable of predicting their anxiety levels prior to a difficult meet.

The abundance of research centered on the performance-anxiety relationship suggests that this construct is regarded as a very important factor affecting both performance process and outcome. But, the interesting debate existing in the anxiety literature is whether or not anxiety can be perceived as positive to performance or is the athlete merely aroused or activated? Do athletes need to be educated on the positive and/or negative effects of anxiety on performance consistency and control and as such, does this affect the kind of responses that are elicited in the competitive environment? In addition, do athletes need to be aware of their experiences so that they can learn to cope with them through the process of monitoring?

In acknowledging the importance of monitoring anxiety states in the competitive swimming environment by examining the multidimensionality of anxiety, the other fundamental issue lies in determining whether or not anxiety has the potential to explain performance variability alone or does the relationship with other constructs contributing to a complete psychological profile of an elite athlete have more influential power over performance expectation in the sport setting.

Confidence

The study of sport confidence is drawn for the most part from self-efficacy theory (Bandura, 1977). According to Bandura (1986), perceived self-efficacy is an individual's judgment of his/her capabilities to organize and execute a course of action required to attain a desired performance. Bandura believes that efficacy expectations and one's level of self-confidence are derived from four sources: performance accomplishments (e.g., being successful in a sporting event), vicarious experiences (e.g., watching others be successful in a sporting event), verbal persuasion (e.g., receiving support and encouragement from significant others), and an awareness and appreciation of one's own physiological and possibly mental states (e.g., increased heart rate signifying one's readiness for competition). The framework for Bandura's work suggests that the four sources of efficacy information, efficacy expectations, and performance are not mutually exclusive. In other words, there are relationships that exist between these three factors, some stronger than others. In light of the effect on athletic performance process and outcome, the potential for monitoring these sources and expectations both physiologically and mentally/emotionally could provide the athlete with critical knowledge in terms of self-regulation, ultimately leading to the safeguarding of performances. In contrast, Vealey, Hayashi, Garner-Holman, and Giacobbi (1998) studied the sources of sport confidence in 335 college athletes from a variety of individual sports (e.g., track, swimming, and gymnastics) and found nine sources. These were divided into three broad categories: achievement, self-regulation, and climate. According to Vealey and her colleagues, athletes attain confidence firstly from achievement, which includes self mastery and demonstration of ability, secondly from self-regulation, which comprises of physical/mental preparation and physical presentation, and thirdly from the immediate climate, which includes social support, coaches' leadership, vicarious experience, environmental comfort, and situational favorableness.

Confidence Research in Sport. Vealey (1986) defines sport confidence as a belief in one's abilities to successfully perform a required task. The construct is multidimensional in nature and is reflected in both trait and state sport confidence. Trait sport confidence refers to a disposition or tendency for an individual to possess a strong belief about their ability to succeed in their sport and is assessed using Vealey's Trait Sport Confidence Inventory. State sport confidence refers to the belief an individual possesses about their ability to be successful in that precise moment in time in their sport and is measured using Vealey's State Sport Confidence Inventory. Included in Vealey's conceptual model is the construct of "competitive orientation", which addresses the relationship between confidence and motivation, and deals with the drive an individual possesses to accomplish goals within their particular sport.

More recently Manzo et al. (2001) have defined sport confidence, as the interaction between dispositional optimism, sport competence, and perceived control. Athletes need to exhibit a highly confident state of mind in order to perform consistently well. In other words, if athletes possess an optimistic perspective, they are more likely to continue pursuing the goals they have set for themselves. This continued persistence will likely help to improve skill development, and as such, increase athletes' beliefs that they can complete a task required by their sport (i.e., exhibit sport confidence). In addition to increasing their motivational levels and reducing their negative anxiety, athletes can view these competence tasks as a direct result of their specific abilities and skills. For the purposes of the present study, we will operationalize sport confidence using Manzo et al.'s (2001) definition.

In order to measure the construct of sport confidence, Manzo (1995), Manzo et al. (2001), and Mink (1996) developed the Carolina Sport Confidence Inventory (CSCI). The researchers adopted a dispositional perspective and identified two factors within sport confidence: sport competence and dispositional optimism. Sport competence includes both an athlete's successes and failures during their lifetime in the competitive sport environment. Dispositional optimism refers to the tendency of athletes to trust that good things will happen to them more often than bad things.

Confidence Research in Swimming. Research that specifically focuses on confidence and swimming performance has been conducted in conjunction with the construct of anxiety (Hanton & Connaughton, 2002; Psychountaki & Zervas, 2000; Zeng, 2003). Most research has utilized the CSAI-2 instrument to study the relationship between anxiety, self-confidence, and performance (Fletcher & Hanton, 2001; Jones & Hanton, 2001; Jones et al., 1993; Robazza & Bortoli, 2003; Swain & Jones, 1993; Wiggins & Brustad, 1996).

Hanton and Connaughton (2002) studied retrospective explanations of the relationship between anxiety symptoms, self-confidence, and performance in six elite and six sub elite competitive swimmers. Using interview methods, findings indicated that the most salient factor in interpreting the direction of anxiety was perceived control. In other words, anxiety symptoms that were perceived to be under control were interpreted to be facilitative to performance, whereas anxiety symptoms perceived as not under control were deemed debilitative to performance. In the case of self-confidence, a positive relationship was found in that an increase in self-confidence resulted in improved performance and a decrease in self-confidence resulted in decreased performance.

Wiggens and Brustad (1996) studied the perception of anxiety (i.e., facilitative or debilitative) and self-confidence using the CSAI-2. The research used 91 athletes from the sports of soccer, swimming, and track and field. Findings revealed that those athletes with lower scores on pre competition cognitive and somatic anxiety and higher scores on pre competition self-confidence tended to perceive their anxiety as more facilitative to performance.

In a case study examining peak performance in seven world class elite swimmers, swimming excellence was characterized by physical talent, outstanding psychological racing skills, and positive attitudes towards training. Peak performance for these swimmers was inclusive of possessing high levels of self-confidence, controlled arousal, belief in training, strong attentional skills, and a peaceful and complete state of mind (Troup, 1991).

In the sport of swimming the value of consistently high levels of self-confidence as a critical performance factor cannot be underestimated. The difference between first place and second place finishers can be as marginal as 1/100th of a second. Consequently, the need to accurately monitor an athlete's confidence states, within pre performance settings maybe vital and certainly an advantage.

Research in the area of confidence and elite swimming is minimal. As such it has been suggested that understanding and monitoring what triggers increased levels of self-confidence and their relationship to other psychological constructs (i.e., anxiety, motivation, concentration, recovery, and mood states) may provide insights into specific interventions necessary to help athletes increase confidence levels and thus improve performance (Vealey, et al., 1998).

Concentration

In self-paced sports, attention, concentration, and focus can be determining factors as to whether or not athletes will be successful in their performance endeavors. Attentional focus has been defined within the sporting context as the ability to attend to proper stimuli during competitive tasks (Nideffer, 1990). This reflects the athletes' ability to process both internal (e.g., thoughts or bodily sensations) and external (e.g., noise, officials, or media) stimuli in the competitive environment. This ability is either instinctive or automatic, or deliberate and controlled and certainly bears considerable influence on performance process and outcome. Responses viewed as automatic are those that are ingrained and somewhat involuntary, but are acquired through practice and rehearsal. In the sport of swimming an automatic response would be the transition from the dive to the stroke or knowing the number of strokes to the wall necessary to execute a successful turn. On the other hand, responses that are viewed as controlled are those that must be carefully and consciously considered when exercising the skill/task. The actual number of response items that can be safely considered or attended to might be restricted. A controlled performance response within the sport of swimming may be attempting to make a dive after a swimmer has false started. This controlled response may be much more significant for the swimmer who actually had the false start as he/she may be much more cautious the next time around. Concentration is the ability to control relevant thought processes by being in the here-and-now. It is a relaxed state of mind that allows the athlete to receive and interpret information. Focus is the ability to control all the attentional processes and direct them towards the task while at the same time eliminating or minimizing any distractions (Nideffer, 1993). The current study operationalizes concentration, focus, and attention using Nideffer's (1993) definitions.

Concentration Research in Sport. Research has shown that a concentration-performance relationship does exist in that a loss of concentration generally leads to performance decrements (Moran, 1996). Garfield and Bennet (1984) studied various aspects of exceptional performance among elite athletes and found that out of a total of eight physical and mental components of performance, three of them were related to powers of concentration. The three components were: (a) being in the present or here-and-now; (b) experiencing a relaxed state of mind while enjoying a high level of concentration; and (c) having a keen awareness of both the internal and external environment and of the performance distractions these might impose.

Researchers focusing on the attentional differences between elite and non-elite athletes suggest that the direction of an athlete's concentration is a distinguishing factor between these two groups of performers (Moran, 1996). Specifically, successful athletes are less distracted by irrelevant cues and tend to adapt a more task oriented focus thereby eliminating any performance outcome distractions (Williams & Krane, 1998).

Investigations dealing with directions of concentration, differences between successful and unsuccessful athletes, and differences between elite and non-elite athletes stems from the theoretical framework proposed by Nideffer (1976, 1992, 1993). This model takes into account different attentional styles when studying concentration in various sporting contexts.

Nideffer's model (1976, 1992) views attentional focus along two dimensions: width (broad or narrow) and direction (internal or external). A broad style of focus allows the athlete to perceive the environment and any rapid changes that occur in that environment whereas a narrow style of focus allows the athlete to only focus and respond to one or two cues in the environment. An external focus is when athletes tend to direct attention toward an object outside of the self, whereas an internal focus is when athletes direct their attention inward toward their own thoughts and feelings.

By combining the two dimensions, four categories emerge. An external-broad focus allows for an athlete to assess and react to the situation (e.g., stroke rate, distance from wall, and other swimmers). An internal-broad focus is used for analyzing and planning strategies (e.g., stroke counts and turn speed). An external-narrow focus is used to focus on a minimum amount of cues in the environment (e.g., focus on pool markings only when going into a turn), whereas an internal-narrow focus is used to rapidly assess the situation and to ultimately produce the rehearsed plan (e.g., focus on one cue word or trigger when going into a turn) (Nideffer, 1976, 1992).

Concentration Research in Swimming. In the sport of swimming, swimmers need to employ a specific attentional style in order to focus on their race strategies, ideal emotional states and ideal performance states, while maintaining focus in the here-and-now, and being aware of any internal and external distractions. The importance of concentration and attentional styles is critical since a lack of concentration or a lack of proper use of attentional styles may lead to an increase in tension, a decrease in self-confidence, and diminished motivation (Hogg, 2000). Competitive swimming environments are subjected to external distractions (e.g., noise, media, other swimmers, etc.). Once swimmers have acquired the proper and appropriate attentional styles required for the various strokes and events, successful performance may ensue (Hogg, 2000; Nideffer, 1993).

Specific research in the area of swimming and concentration is extremely limited yet opportunities to study the area seem promising. The present research utilized the concentration disruption subscale of the SAS instrument (Smith et al., 1990) to identify the athlete's general concentration disposition in the sport of swimming. The lack of research conducted using this subscale has been acknowledged in the literature (Krane, 1994). Nideffer (1992) suggests that by using single subject designs more effectively, better care can be given to creating customized individual training programs with a focus towards individual differences around internal versus external distractions.

Within the sport of swimming, preparation for all eventualities is critical. As such, monitoring the types of distractions and their impact on the individual swimmer is also imperative to creating consistent performances. Elite swimmers face high pressure situations where not only do they have to cope with internal distractions, but also subtle external distractions (e.g., those presented by other competitors, coaches, or media) that may have not existed at lower level competitions. Therefore, in order to safeguard performance preparations and consistency, both physical and mental, acquiring proper attentional skills targeting specific situations would be helpful in the first instance. Further, the awareness through self-monitoring, of those internal or external distractions that endanger performance and the ability to control them would likely improve performance.

Motivation

Motivation is a significant performance factor and one that has been extensively addressed and examined in the sport psychology literature (Braathen & Svebak, 1992; Hellandsing, 1998; Vallerand & Losier, 1999; Vlachopoulos, Karageorghis, & Terry, 2000). A popular theoretical view of motivation and sport performance and one favored in swimming research was proposed by Deci and Ryan (1985, 1991). They posited that motivational behavior exists on a continuum that includes intrinsic motivation, extrinsic motivation, and amotivation. Intrinsic motivation refers to performance behaviors athletes engage in for their own sake and satisfaction (e.g., to learn new skills, focus on having fun) (Deci, 1975). This type of motivation stems from the need to feel competent and self-determined. Extrinsic motivation refers to a wide variety of behaviors engaged in as a means to an end rather than for their own sake (e.g., to receive rewards: medals, trophies, money) (Deci, 1975). According to Deci and Ryan (1985), there are 2 types of extrinsic motivation: self-determined and non-self-determined. Self-determined extrinsic motivation occurs when a behavior is valued by an individual athlete and is perceived as voluntary or internally regulated. Non-self-determined extrinsic motivation is essentially externally regulated and the athletes act as a consequence of those external influences. Amotivation refers to behaviors that appear to be neither intrinsically nor extrinsically motivated. Individuals do not perceive a relationship between their actions and the outcomes of their actions. They generally experience feelings of incompetence and lack of control (Deci & Ryan, 1985). For the purpose of this study, intrinsic motivation, extrinsic motivation, and amotivation will be operationalized using Deci and Ryan's (1985) definitions.

Motivation Research in Sport. A relatively new measure of motivation in sport has been developed by Pelletier et al. (1995) called the Sport Motivation Scale (SMS). The SMS consists of 28 items representing reasons for participating in sport. The measure includes intrinsic motivation to know (e.g., "for the pleasure it gives me to know more about the sport"), intrinsic motivation toward accomplishment (e.g., "because I feel a lot of personal satisfaction while mastering certain difficult training techniques"), intrinsic motivation to experience stimulation (e.g., "for the pleasure I feel in living exciting experiences"), identified regulation (e.g., "because in my opinion it is one of the best ways to meet people"), introjected regulation (e.g., "because it is absolutely necessary to do sports if one wants to be in shape"), external regulation (e.g., "because it allows me to be well regarded by people that I know"), and amotivation (e.g., "I used to have good reasons for doing sports, but now I'm asking myself if I should continue doing it"). The assumption exists that intrinsic motivation and self-determination benefit performance in sport. Evidently, the more intrinsically motivated and self-determined individuals are, the more involved they will be in the task and as a result, produce a more successful performance than their counterparts (Pelletier et al., 1995).

However, a study examining sport motivation and elite Bulgarian athletes (N=98), the researchers found that title and medal holders displayed higher levels of non-self-determined extrinsic motivation as well as higher levels of amotivation than less successful athletes. In terms of gender differences, females were more intrinsically motivated than their male counterparts (Chantal, Guay, Dobreva-Martinova, & Vallerand, 1996). Fortier, Vallerand, Briere, and Provencher (1995) studied the relationship between competitive and recreational sport structures, gender, and athlete's sport motivation in 399 athletes from badminton, basketball, volleyball, and soccer. They found that competitive athletes needed less intrinsic motivation to experience stimulation and to accomplish things, they engaged in more self-regulation, and were more amotivated. Female athletes were found to be more intrinsically motivated to accomplish things, used more self-regulation strategies, were less extrinsically motivated, and had lower levels of amotivation than male athletes.

Motivation Research in Swimming. Pelletier, Fortier, Vallerand, and Briere (2001) completed a two year study with competitive swimmers (N=368) to examine which swimmers persisted and which swimmers dropped out. The subjects completed questionnaires including the Sport Motivation Scale (Pelletier et al., 1995) and also one observing their perceptions of their coach's interactive style dealing with control and autonomy support. Results from this study supported Vallerand's (1997) hierarchical model of intrinsic and extrinsic motivation. Specifically, coaches' support of autonomy was positively related to intrinsic motivation and identified regulation, but negatively related to amotivation and external regulation. On the other hand, the coaches' controlling behaviors were positively related to external regulation and amotivation but negatively related to intrinsic motivation and identified regulation. Ultimately, a sporting environment that supports athlete independence as well as a positive coach-athlete relationship enhances intrinsic motivation and the athlete's ability to value a particular behavior that allows them to participate out of choice. Persistence over the two year study was impacted by amotivation and intrinsic motivation respectively. While the external regulation had little impact on the first year of the study, it became increasingly negative over time while intrinsic motivation became even more important. Thus, swimmers tended to drop out when the social or material rewards ended (Roberts, 2001). These findings suggest that the coach who interacts with swimmers in a supportive manner will facilitate their levels of motivation in a positive direction.

Kamal (1989) examined extrinsic and intrinsic motivation in swimmers (N=40) within two age groups (10-12 and 13-15). He found that swimming performance improved with extrinsic rewards; however he cautions that intrinsic motivation may be undermined with the overuse of material rewards. Also, the study demonstrated that due to social factors apparent at competitive swim meets, improvements in performance times occurred regardless of age. Lastly, it was demonstrated that as swimmers approached adolescence, motivation from extrinsic rewards was displaced by intrinsic motivation obtained from personal success.

Earlier research by Watson, Blanksby, and Bloomfield (1984, 1985), highlighted the major participation motives of junior competitive swimmers. These were listed as: the pursuit of excellence, winning and rewards, improving skills, and friendship. On the other hand, major discontinuance motives included: wanting to do other things, no longer having fun, too much pressure, and boredom in training. The results of this research led to the belief that motives for participating and discontinuing in sport are more external rather than internal at the junior competitive level.

Participation motives among competitive swimmers were also addressed by Gould and Horn (1984) and Brodkin and Weiss (1990). They found that competence, fitness, affiliation, team aspects, competition, and fun and enjoyment contributed to persistence in the sport. Gould, Fletz, Horn, and Weiss (1982) studied the primary causes for attrition and discontinuation in competitive youth swimmers and found that interest in other activities was the major reason for swimming attrition and that gender and experience were not factors affecting their decision. Other reasons were lack of learning, seeing no skill improvement, overemphasis on competition, dislike for coach, and lack of fun and enjoyment.

Within the sport of swimming, motivation is a force that drives a swimmer to achieve a top-level performance (e.g., a personal best time). An elite swimmer must possess specific motivation levels in order to reach peak performance. These levels of motivation can also be ignited through the process of meaningful and challenging goal setting. Adherence to setting short and long term goals can contribute significantly to an athlete's approach toward training and competition. Furthermore, setting clear and challenging goals is imperative in every athlete's path toward self-monitoring and self-regulation (Behncke, 2002). For example, in the sport of swimming, Burton (1983) studied the effects of a goal setting training program on the performance and perceived levels of self-confidence, motivation, and state anxiety on both male and female intercollegiate swimmers. Findings of this study revealed that those swimmers who took part in the goal setting process tended to set performance goals and those swimmers who displayed sufficient goal setting ability performed better than their counterparts. In addition, they also possessed positive perceptions of their performance states. Burton (1984) further supported these findings with National Sports Festival swimmers encouraging the use of goal setting as a motivational tool. These findings demonstrated a positive relationship between goal setting and performance as well as to positive perceptions of psychological states.

Motivation in swimming is particularly important during long training spells between major competitions, during the process of goal setting, learning new skills or improving specific stroke techniques, conditioning the body and mind, preparing for optimal performance, and improving the quality of performance. Although the role of a coach and/or sport psychology consultant is limited in terms of the degree to which they can influence the motivational process of an athlete, by monitoring and profiling an elite swimmer across a season, the typical motivation-performance relationship can be identified.

Recovery

The demands placed upon athletes within high competitive sporting environments result in increased levels of stress, and as such, to compensate for the high levels of stress, it has been suggested that a period of recovery is necessary (Kellmann & Kallus, 2001). This fine balance between stress and recovery is related to optimal performance in terms of both ideal performance and ideal emotional states. In the competitive environment, an athlete is exposed to both psychological (e.g., pressure, doubt, slumps) and physiological (e.g., injury, burnout) stressors. The post performance recovery phase allows the athlete to take a break and recover mentally and emotionally as well as physically from the intense competitive settings. Kellmann and Kallus (2001) conceptualized the recovery-stress state as the magnitude to which an individual is physically and/or mentally stressed and whether the individual has the ability to utilize appropriate strategies in order to recover. The definition also includes what types of strategies the individual uses. Just as physiological recovery is important to athletic performance, so to is mental/emotional recovery. Hogg (2002) defines mental recovery as the, "…speedy and efficient return to normal psychological and emotional states after intensive training and competition" (p. 182). The significance of mental recovery is vital for the sport of swimming especially when entering the taper phase of a training cycle and between races (Hogg, 2002). The taper phase is generally marked by a substantial decrease in the volume of training. Although the intensity of the training sessions remains relatively the same or is even increased, the recovery periods between the training repetitions and sessions are increased. Also, during this phase of training, technical skills are continually being refined and tactical strategies are reviewed and practiced. The fundamental goal of the taper phase is to prepare the swimmer for peak competition performance.

Another critical time for mental recovery is in the post-performance setting (Hogg, 2002). The post-performance setting is a period of time where athletes have the opportunity to evaluate and reflect upon their performance. This time period also allows the coach to engage in two-way communication with the athlete in order to examine existing performance states as well as discuss what may need to be improved upon to guarantee future successful performances.

The two dimensions of recovery and stress were emphasized by Kellmann and Kallus (2001) and the balance between the two is necessary for successful performance. Recovery has been characterized as a process that occurs over an extended period of time, depends on the length and duration of the stress stimulus, and is highly individual

(Kallus & Kellmann, 1999). Stress has been regarded as a deviation in the state of optimal psychophysical balance.

A model describing the interrelationship between stress states and recovery demands has been developed with the assumption that as levels of stress increase, recovery time must also be increased (Kellmann & Kallus, 2001). Moderate levels of stress give rise to the opportunity for adequate recovery, but once stress levels move beyond moderate levels, the likelihood that an athlete can cope in such a way to control precompetitive stress levels and perform optimally is minimal. This excess stress can ultimately lead to the failing adaptation syndrome, physical and mental burnout, and performance slumps. However, the model suggests that high stress levels may not necessarily be harmful as long as the athlete is able to recover to optimal performance states.

The notion that balance between stress and recovery in competitive sport can lead to optimal performance has been discussed using the IZOF model (Hanin, 2002). Taking an individual approach, the model suggests viewing the individual at a holistic level by identifying performance and recovery states of an individual's psychobiosocial state. This state includes three components: the mental aspect (cognitive, affective, and motivational); the biological aspects (bodily somatic and motor-behavioral); and the environmental social interaction aspect (performance-operational and communicative). This state is a framework for describing the various factors affecting athletic performance. Therefore, an individual's subjective analysis of his/her recovery-stress state may be explored from three different perspectives (mental, biological, and social) ultimately providing a total and comprehensive picture of the individual's recovery-stress state. This holistic view of the athlete is based on the individual's previous performance history as well as recovery activities and the proper use of resources available to the athlete (Hanin, 2002).

To obtain optimal recovery and achieve ideal emotional states it has been suggested that emotional monitoring and profiling of individual athletes is necessary in order to ascertain the current status of the recovery-stress relationship. Using self-report measures such as the Rest and Recovery Questionnaire for sport (RESTQ-Sport) (Kellmann & Kallus, 2001) can help to determine and establish unique performance profile patterns which can further help to indicate when resources should be applied to aid in the recovery process (Hanin, 2002). In order to help athletes consistently reach ideal performance and ideal emotional states, it is necessary to evaluate the resources available to the athletes by examining the inclusion of them in preperformance routines, post performance routines, and technical and tactical strategies needed to help safeguard their future performances. Research suggests that the most beneficial time to take the RESTQ is systematically through a phase of training such as the taper phase as a means of assessing recovery-stress relations. On the other hand, the sport of swimming is highly technical in terms of its training cycles and taking the RESTQ at critical points in the training cycle may also be valuable in identifying how the athlete is dealing with the fluctuations in training loads. Both physical and mental recovery will be operationalized in this study using Kellman and Kallus's (2001) as well as Hogg's (2000) definitions.

Mood States

Another important factor contributing to athletic performance is the ability to control and maintain ideal or optimal emotional feelings prior to, during, and following performance. Emotion as defined by Lazarus (2000) is a phenomenon created by the interaction between psychophysiological reactions within the environment. The reactions occur on three levels: (1) affect or the way an individual perceives the situation (e.g., the situation may elicit feelings of fear, apprehension, or happiness); (2) behaviors or actions (e.g., the tendency to run away or sadness may force the individual to become motionless); and (3) the physiological changes that occur as a result of the interaction (e.g., any increases in heart rate, blood pressure, and skin response). Lazarus extends his definition to include variables and processes involved in triggering and prolonging an emotion. The cognitive, motivational, and relational aspects of an emotion are critical to understanding the phenomenon. He terms this conceptualization of emotions as "relational meaning", which refers to the psychological aspect of emotions. In other words, an individual appraises the relationship and attaches personal meaning to it and ultimately this appraisal affects the well being of the individual. For example, within the sport of swimming, at the sight of the number one ranked swimmer in the world being in the next lane of a final race, average swimmers may feel scared or frightened at the situation they are in (subjective experience), have the tendency to run because of the fear (behavior) but remain in the race due to a strong social pressure of portraying themselves as weak, and due to the fear may have an increase in heart rate (physiological).

Mood states on the other hand are feelings that happen without a stimulus and occur in varying durations. In other words they are not permanent but rather transitory (Morris, 1989; Thayer, 1989, 1996). For example, a feeling of happiness lasting a few hours or even a few days is an illustration of a mood whereas confidence or self-esteem is typically enduring or more stable traits. Research focusing on mood and sport performance has received a great deal of attention in the sport psychology literature (Goss, 1994; Prapavessis & Grove, 1994b; Renger, 1993; Terry, 1995).

Mood States Research in Sport. Terry (1995) argues that the relationship between mood profiles and athletic performance produces equivocal results. Specifically, individuals participating in elite sports tend to show more positive mood profiles than individuals within the general population. However, mood profiles are unsuccessful in differentiating athletes of varying achievement levels. Terry argues that the Profile of Mood States (POMS) is an excellent psychometric measure in distinguishing between successful and less successful athletes with similar levels of ability.

The POMS as modified by Grove and Prapavessis (1992) includes a confidence subscale that has been used to not only distinguish between successful and unsuccessful athletes, but also to help athletes cope successfully with mood fluctuations in order to consistently achieve optimal performance. Terry (1995) specifies that optimal mood profiles are most likely sport-dependent and, therefore, it is critical that an individualized approach be taken. Particularly, the mood fluctuations observed in athletes should be compared to their own previous mood changes versus general group norms. The POMS instrument has also been recognized as a test that may be used to: monitor an athlete's mindset, initiate one-on-one discussion, improve mood states over time, monitor training load, and create individualized mental training programs (Terry, 1995).

Mood States Research in Swimming. Raglin, Morgan, and O'Connor (1991) studied changes in mood states during training in female (N=84) and male (N=102) college swimmers over a four-year period. Using the POMS instrument, they found that female and male swimmers demonstrate similar mood states during training. Specifically, they were similar in depression, anger, vigor, fatigue, and confusion, but females tended to have higher levels of tension throughout the four seasons. In accordance with changes in training volume, each of the mood states fluctuated with the exception of tension, which remained high even when the training volume decreased.

Monitoring mood states prior to competition has been found to help distinguish between athletes with successful performance outcomes and athletes with less successful performance outcomes (Prapavessis, 2000). One method of examining the relationship between mood states and performance is within the framework of the IZOF model (Hanin, 2000).

The IZOF model when applied to emotions and performance helps to predict performance outcomes at different emotional intensities for individual athletes (Hanin, 2000; Prapavessis, 2000). The model has been applied to positive and negative affect (Hanin & Syrja, 1995, 1996) and to mood states (Prapavessis & Grove, 1991).

In competitive versus recreational swimming, Berger, Grove, Prapavessis, and Butki (1997) studied the relationship between different lengths of training sessions and mood changes. Using the shortened 40-item version of the POMS questionnaire (Grove & Prapavessis, 1992), the researchers found that young competitive swimmers had a decrease in their total mood disturbance score from pre-practice to post practice during a regular length training period. Specifically, scores on the fatigue subscale increased and scores on the vigor subscale decreased. No mood disturbance changes were reported for shorter duration training periods. Other significant findings from this study were that competitive swimmers tend to place more importance on performance enhancement (i.e., the physical aspect) rather than on the mental or emotional aspect of performance. The researchers also found that there was no association between mood benefits during pre - competition practices and performance outcome during that competition.

Goss (1994) studied the relationship between competitive hardiness and mood disturbance in competitive varsity and club swimmers (N=253) during high intensity training periods. Competitive hardy swimmers were defined as those who can alter their perceptions of stress into less stressful appraisals. The researcher found a positive correlation between hardiness and age as well as a relationship between mood disturbance and age. Specifically, as age increased in the sample of swimmers, mood disturbances occurred less. A negative relationship was found between hardiness and mood disturbance in that as hardiness increased, mood disturbance decreased.

Currently, the swimming literature suggests that there is a need to monitor mood states in competitive athletes in order to determine if there is a relationship between mood disturbance levels and performance outcomes (Berger et al., 1997; Goss, 1994; Terry, 1995). For the purpose of this case study, emotions will be operationalized using Lazarus's (2000) definition and mood states will be operationalized using Morris (1989) and Thayer's (1989, 1996) definition.

Generating a complete psychological profile of an elite competitive swimmer through repeated measures across a season allows the IZOF model to be extended beyond the anxiety, mood states, and affect research. Anxiety, confidence, concentration, motivation, recovery, and mood states have all been recognized as important factors that may positively and negatively affect athletic performance. As such monitoring these psychological variables within an elite swimmer may possibly allow for a rigorous mental training protocol to be implemented prior to an athlete competing at a major competition. By following a customized psychological skills training program, the opportunity for the athlete to experience consistent peak performances within their zone of optimal functioning in a consistent manner may be enhanced. But, by monitoring these psychological constructs, the athlete may develop a greater sense of awareness of performance consistency and control.

Therefore, the purpose of this research was to: (1) extend the application of the IZOF model to include various psychological constructs; (2) develop an athlete-generated measure to identify and establish a more accurate and specific performance profile; (3) use qualitative and quantitative methods to learn about the mental/emotional experiences of an athlete across a competitive swim season; and (4) to monitor using repeated measures across a competitive swim season and thereby identify any trends, patterns, and tendencies in a complete psychological profile of an elite swimmer (Butler, 1997).

CHAPTER 3

Method

Case Study Design

The present study took the form of a case study design. A case study is a comprehensive research strategy that is designed to bring out performance details from the viewpoint of the participant by using multiple sources of data (Tellis, 1997; Yin, 1994). When applied to the field of sport psychology this approach opens doors to understanding the motives of athletes, their thinking patterns, and the attributes or profile of athletes which influence or change athletic behavior.

The value of case studies as a legitimate research design lies in its capacity to allow researchers the opportunity to examine rare phenomena in small numbers, create a wealth of ideas and predictions about behaviors and processes of change, and provide strong evidence to enhance theory development and future systematic research (Smith, 1988).

In lieu of the depth of the current study (i.e., qualitative and quantitative methods, time frame and commitment), and understanding the fundamental objective of learning about the monitoring process through the eyes of the selected athlete over an extended time period, the case study design was deemed to be the most appropriate. Case studies in the sport psychology field allow for researchers to investigate a phenomenon in real-life contexts (Holt, 2003; Lloyd & Trudel, 1999). Down the road, as is common with most research in this area, enhancing the psychological well being of the athlete and improving performance was hoped to be the ultimate outcome of this research.

Participant

The central participant for this case study was an elite female swimmer referred to as Athlete A (age 17 years) belonging to a high profile swim club located in Alberta. The athlete was categorized as elite within this swim club because she had achieved her national qualifying times as set by Swimming Natation Canada (SNC) the governing body of competitive swimming in Canada. According to Feltz and Ewing (1987), an elite athlete is defined as one who competes at the international and/or professional level for a minimum of two years in his/her chosen sport. Vanden Auweele, De Cuyper, Van Mele, and Rzewhicki (1993) consider an elite athlete as an individual that has eligibility for competing at the national, international, or Olympic level. Their definition also includes those athletes that are involved in professional sports. An elite swimmer may have a competitive lifespan of anywhere between eight and sixteen years, though naturally there are exceptions and extremes.

Swimmer A was purposely chosen for this study as she met the criteria necessary to complete the goals of this case study research (Schloss & Smith, 1999). Criteria for this study included being classified as an elite athlete, achieving national standards within the sport of swimming, and being between the ages of 15 and 17 years. In addition, this athlete was highly motivated to participate, which is a critical quality considering the length, depth, and time commitment required to participate in the fullest sense.

Instrumentation

Athlete A's anxiety, confidence, concentration, motivation, recovery, and mood states were monitored at regular intervals across a swim season (September 2002-March 2003) using the following trait and state sport-specific questionnaires:

Trait Measures. The Sport Anxiety Scale (SAS: Smith et al., 1990) (See Appendix A) was used to measure Athlete A's cognitive and somatic anxiety traits, and concentration disruption. This scale comprises of twenty-one items with seven items in each of the three subscales. Sport psychology literature suggests that more research is needed to assess the validity of the SAS instrument, but the scale appears to have promise as a future research tool (Smith et al., 1990). It was given to the athlete twice throughout the data collection period; once at the beginning and again at the end of the monitoring period. This data was used to create Athlete A's psychological profile.

The Causes of Anxiety in Sport Scale questionnaire (CASS: Marchant et al., 1997) (See Appendix B), modified specifically for the sport of swimming as adapted by Hogg (1997b) allowed for the assessment of Athlete A's sources of anxiety, intensity, frequency, and whether items were of concern to her or not. The questionnaire was given at the beginning and at the end of the data collection period and the data was added to Athlete A's psychological profile.

The Carolina Sport Confidence Inventory (CSCI: Manzo et al., 2001) (See Appendix C) was used to measure Athlete A's sport confidence states. This scale comprises of thirteen items with items falling into two distinct subscales. Six items load onto the sport competence subscale and seven items load onto the dispositional optimism subscale. This instrument has been found to be a valid and reliable measure to examine the construct of sport confidence (Manzo, 1995; Manzo et al., 2001; Mink, 1996). This instrument was given to Athlete A twice; at the beginning and the end of the data collection period with the resultant data being factored into Athlete A's psychological profile.

The Sport Motivation Scale (SMS: Pelletier et al., 1995) (See Appendix D) was used to measure Athlete A's levels of intrinsic motivation, extrinsic motivation, and amotivation. This scale comprises of seven subscales (28 items) that measure three types of intrinsic motivation, three types of extrinsic motivation, and amotivation. This instrument has been tested with competitive swimmers and viewed as a valid and reliable measure of sport motivation (Li & Harmer, 1996; Pelletier et al., 1995). It was given to Athlete A twice; once at the beginning and the end of the data collection period and the data was added to Athlete A's psychological profile.

State Measures. The Competitive State Anxiety Inventory-2 (CSAI-2: Martens et al., 1990) (See Appendix E) was administered to measure Athlete A's cognitive and somatic anxiety states as well as her existing states of self-confidence. This scale comprises of twenty-seven items with nine items in each of the three subscales. The respondent rated her answers on a four-point likert scale (1=not at all and 4=very much so, no neutral response). This instrument has been found to have strong internal consistency, with reliability coefficients for each subscale between .8 and .9 (Gould, Petlichkoff, & Weinberg, 1984; Martens et al., 1990). Adequate validity of the CSAI-2 has been established (Martens et al., 1990; Burton, 1988). It was administered approximately two hours before Athlete A's main competitive event (100m Backstroke) with the data being added to her psychological profile.

The Mental Readiness Form (MRF: Murphy et al., 1989) (See Appendix F) was developed as an alternative to the CSAI-2 to measure competitive cognitive and somatic anxiety states. This brief instrument was completed approximately one hour before Athlete A's performance in advance of her main competitive event. It took seconds to complete and was not considered intrusive. For the purposes of this study, the MRF was used in conjunction with the CSAI-2. The MRF consists of three, ten-centimeter bipolar lines on which Athlete A indicated by pinpointing on the lines exactly to what degree she felt aroused and/or activated. Validity of the MRF instrument has been found with moderate correlations to the CSAI-2 (Krane, 1994). The data was added to Athlete A's psychological profile.

The Rest and Recovery (RESTQ-Sport questionnaire: Kellmann & Kallus, 2001) (See Appendix G), a recent diagnostic psychological tool designed to measure the stress-recovery interaction at significant points within each phase of training (macro), was completed at least three times as determined by the coach following the hard training phase and during the taper phase (3-4 weeks prior to major/peak competition) leading up to the Junior National Short Course Championships (February, 2003). The scale comprises of 77 items that are divided into 19 subscales clustered into four different categories. These four categories are labeled general stress, general recovery, sport-specific stress, and sport-specific recovery. Current research as well as a pilot study investigating the sources of anxiety among elite and developmental swimmers using the RESTQ-Sport has proven it to be a reliable and valid measurement tool (Hogg, 1999; Kellmann & Kallus, 2001). The data was added to Athlete A's psychological profile.

The Profile of Mood States (POMS: McNair, Lorr, & Droppelman, 1971) questionnaire as modified by Grove and Prapavessis (1992) (See Appendix H) to include a measure of self-confidence in pre and post competition, was given prior to and after Athlete A's main event. The scale comprises of 42 items for both the pre and post POMS. The items yield scores on seven different mood state subscales (i.e., vigor, tension, anger, confusion, fatigue, depression, and esteem/confidence). Grove and Prapavessis (1992), in a study of female netball players found initial evidence for the subscale structure, internal consistency, and validity for their abbreviated version of the POMS. Research in the field has also confirmed the reliability and validity of this shortened version of the POMS (Berger et al., 1997; Prapavessis & Grove, 1994a, 1994b). The pre POMS measure was given within one hour prior to performance and the post POMS measure was given within one hour after performance. In addition, it was necessary to administer a brief measurement tool to assess both Athlete A's perceived competence and perceived importance relative to the upcoming race. Therefore, using the same format for tests other than the MRF and AGI, Athlete A was asked to evaluate her perception of readiness prior to her performance. This question was added to the Pre POMS questionnaire. Equally, a measure of the actual importance or perceived criticality of the race was administered at the same time. The data was added to Athlete A's psychological profile.

The Mental States of Readiness and Satisfaction Form (MSRS: Hogg, 2002) (See Appendix I) was given approximately one hour following Athlete A's major swimming event. The scale comprises of 16 items with scores relating to two assessment subscales, perceived performance readiness and perceived performance assessment/satisfaction. Reliability and validity for this instrument has not yet been established statistically though the MSRS has been used in several sports (e.g., swimming, soccer, basketball, volleyball, and shooting). It was administered to Athlete A in the post competition setting following her main event to ascertain a measure of her "within race" focus as well as her perceptions of whether a readiness-satisfaction relationship was attained. The MSRS has been developed as a self-reflective debriefing tool for the use of competitive swimmers and coaches in the post performance setting (Hogg, 2002). The data from the MSRS was added to Athlete A's psychological profile.

The Athlete Generated Instrument (AGI) (See Appendix J) measures the four major performance factors (anxiety, confidence, concentration, and motivation). The AGI consists of four, ten-centimeter bi polar lines (similar to the MRF format) on which Athlete A indicated by pinpointing on the lines exactly how she felt in regards to these performance factors. This brief instrument was completed approximately one hour before Athlete A's performance in advance of her main competitive event. Reliability and validity of this instrument has not yet been established statistically as it was created solely for the purposes of this case study. The data from the AGI was added to Athlete A's psychological profile.

Procedure

Athlete A was chosen to participate in this study due to the researcher's previous involvement with the swim club and particularly with this swimmer. Consent to participate in this study was granted by Athlete A, her parents, and her Head Coach. Since Athlete A was under the age of 18 years, parental consent was required by reading and signing an information and consent form outlining the details of the study (See Appendix K).

The collection of data occurred over a six-month competitive swim season (September 2002-March 2003), which included two macros or training cycles (Bompa, 1990) (See Appendix L). Data collection consisted of completing questionnaires and participating in two interviews, one pre season and one post season (each lasted approximately 45 minutes). In addition to the questionnaires and interviews, Athlete A also participated in debriefing sessions as well as informal conversations with the researcher after each of her performances. During the six month time frame, there were established phases of training to develop the appropriate motor skills and energy systems interspersed with a series of significant racing opportunities culminating in a major meet at the conclusion of the second macro (Junior National Short Course Championships, February 2003). The number of significant swim races, that is, where performance outcome is very important, was determined by the Head Coach and Athlete A. In total there were 16 significant swims including both heat and final races. This six month period also allowed for regular weekly meetings with a SPC (sport psychology consultant), athlete observation during training and meets, interviews, and informal discussions with Athlete A as to her perceptions of progress.

Performance was documented by using the swimmer's objective performance or race time for her selected main event and comparing this to her lifetime best time. In addition, Athlete A, as well as her Head Coach, were asked to rate each significant race on a simple performance rating scale. Since one does not exist in the sport psychology area, Athlete A was simply asked in the post performance setting to rate all four components of her race, that is, the technical, tactical, physical, and mental aspects of her performance. The Head Coach was also asked to rate Athlete A on the same dimensions. The scale ran from 0-10 (0 = poor performance and 10 = excellent performance) (Hogg, 2002). All physical training data was monitored by the Head Coach who also had access to the psychological data, but only with consent of Athlete A.

Interviews

Interview Guide. Conroy, Poczwardowski, and Henschen (2001) suggest that by using interviews, perceptions of success and failure as well as consequences for success and failure may be identified. In addition, these perceptions and consequences may in fact be associated with motivation and emotions within the context of performance. The interviews were 45-50 minutes in length and followed a regular training session. The first pre season interview occurred prior to the start of Athlete A's swim season and was conducted in a closed room on the pool deck. The purpose of the initial informal interview was to tease out unique key terms and phrases associated with Athlete A for each item chosen from the list of adjectives reflecting the psychological constructs under study (See Appendix M). The interview helped to create an athlete-generated instrument to cue in performance readiness states as well as to provide a pre performance checklist which was given throughout the research process. The second post season interview occurred at the conclusion of the second macro and following a sufficient time lapse that allowed for self-reflection across the season. It was also conducted in a closed room on the pool deck. The purpose of the second in-depth interview was to support and compare the data gathered using the existing psychometric measures (See Appendix N)

The first interview guide was created using existing psychometric measures (e.g., CSAI-2 and POMS) whereas the second interview guide was generated from a pilot study conducted by Hogg (1999) studying sources of anxiety in elite and developmental competitive swimmers.

Both interviews were conducted with a fairly open framework, allowing for focused, conversational, two-way communication (Fettermann, 1998; Kvale, 1996; Yin, 1994). The interviews began with a brief explanation of the research, Athlete A was assured privacy and confidentiality, and permission was requested to tape-record the sessions. Rapport was established with Athlete A from previous interactions as the researcher has been involved with this particular swimmer and swim club for at least two years. Probing throughout the interviews was also carried out through nodding, encouraging, and thanking Athlete A when necessary.

Pre Season Interview. In order to generate a customized instrument and support the performance data collected, more details on Athlete A's unique perceptions and experiences regarding her existing states of anxiety, confidence, concentration, motivation, recovery, and mood states in the pre performance setting was solicited using a semi-structured interview technique.

It has been acknowledged that athlete-generated instruments that are unique to the performer being monitored provide rich meaning and relevance to the profile (Hanin, 2000). In order to produce this idiosyncratic scale, Athlete A was provided with a list of items pertaining to the psychological constructs relevant to the research (i.e., anxiety, confidence, concentration, and motivation). The list was developed using items from the already existing psychometric measures for each factor. Once the list had been finalized and categorized according to each performance factor, Athlete A was asked to select *at least* one item from each factor (or add her own) that best characterized her psychological state prior to performance.

Following item selection, the investigator interviewed Athlete A and discussed each chosen item by asking her, "What does this word mean to you?" The purpose of this informal interview was to ascertain a better understanding of Athlete A's perceptions of her definitions of the words she chose. Also, the interview helped to further develop the questionnaire into a precise and unique measure specific to the athlete selected for this research.

Lastly, the athlete-generated questionnaire was divided into sections reflecting each psychological variable intended to be studied. As well, to rate each item the magnitude estimation (ME) method was used since the current research is a single subject design and within-or interindividual comparisons were not needed. Four, ten centimeter bipolar lines similar to the MRF scale was utilized. An even numbered scale was chosen so as to eliminate a neutral response. In other words, by having an even numbered scale, Athlete A was forced to be more polar or specific with her responses.

To ensure reliability of this instrument, a review of the tape and transcribed interview was conducted simultaneously to ensure that errors were minimized and accuracy of the interview content was preserved. To ensure validity of the instrument, the athlete chosen for the study was asked to review the instrument for accuracy of personal terms, phrases, and meaning conveyed.

Post Season Interview. The post season interview took on a semi-structured approach and started with general questions or topics regarding the major psychological variables that affect performance highlighted for this study. As relevant issues were identified, relationships were noted and more specific questions drawn up, allowing both the interviewer and Athlete A the flexibility to probe for details or discuss issues. At the end of the interview, Athlete A was given time for additional comments after the tape recorder had been shut off, and given an explanation of how the information was to be used.

The design of the interview framework was semi-structured and flexible and included topics or questions for discussion. These reflected the relationship between select psychological constructs (e.g., anxiety, confidence) and good or poor, satisfactory or unsatisfactory performance outcome. Due to the exploratory nature of the research, open-ended questions such as "how"? and "what"? were used to acquire descriptive responses (Kvale, 1996).

In order to fulfill the purpose of a qualitative research interview the interview component of the existing investigation followed the guidelines developed and suggested by Kvale (1996). This process involved creating a safe and comfortable environment for Athlete A, framing the interview by briefing her at the beginning and debriefing at the end, and following ethical guidelines (i.e., informed consent, confidentiality, and consequences).

Conversational Interview. In addition to the two interviews, Athlete A was also required to participate in informal conversational interviews prior to and post performance for her main event (Morse & Richards, 2002; Patton, 2002). Informal conversational interviews are open-ended and spontaneous dialogue between the researcher and participant. In such interviews, the same person may be interviewed on various occasions, in this case, before and after each performance. Note taking or tape recording of the conversation may be done if the environment has been established as trusting and comfortable. In the present study, questions prior to performance were consistent at most meets with few variations, for example, "what is your goal for this race?" or "how do you feel at this moment?" In the post performance debriefing setting, a set of core questions (Hogg, 2002) was asked and recorded by the researcher. Strengths of the informal conversational interview are: it is flexible, acknowledges individual differences, and the context may be taken into consideration in order to deepen communication. On the other hand, typical disadvantages of this type of interview style are: the interviewer effects, leading questions, biases, and the personality of the researcher (Morse & Richards, 2002; Patton, 2002).

Debriefing

Debriefing is an evaluative process carried out by coaches and athletes not only in competition, but also in training. Debriefing allows coaches and athletes to: (1) analyze current performance with the intention to improve areas where necessary; (2) develop key insights into the athlete's internal states; and (3) share relevant and meaningful information in regards to performance process and outcome (Hogg, 2002). A debriefing protocol outlined by Hogg (2002) was followed after each major event.

In addition to the MSRS, Athlete A underwent a debriefing process at the end of each performance with the investigator. Following the debriefing model outlined by Hogg (2002), Athlete A had the opportunity to reflect and evaluate her performance by answering a selection of five core debriefing questions proposed by Hogg (2002) (See Appendix O).

Data Analysis

An inductive approach to the analysis of the interview data was followed using the constant comparative method (Glaser & Strauss, 1967). The formal analysis of the data was carried out after the transcriptions and the coding of data had been completed.

Once the interviews had been tape-recorded, the first step in the analysis process was to transcribe the interviews verbatim. Transcribing interviews allowed for a more in depth check of the data. It was critical that no information was lost throughout this process. Factors that were addressed during the transcription process were: the nature of the material, time and money available, technical details (i.e., how long it would take and who would do it) as well as issues around reliability and validity (Kvale, 1996).

In addressing the reliability factor of the interview analysis process the following procedure was undertaken. The researcher carried out the transcription of the interview and subsequently reviewed the tape against the transcription to minimize error and retain accuracy of the interview.

In contrast to the reliability factor, the validity factor was much harder to address. This was due to the lack of objectivity in determining whether the interview investigated what it set out to study (Kvale, 1996). The focus of the study was to apply the IZOF model as outlined by Hanin (2000) to understand how an elite swimmer's perceived levels of performance are related to her repeated measures of self-reported levels of anxiety, confidence, concentration, motivation, recovery, and mood states. As such, validity was reflected in the interview structure as well as the transcription of the interview. In order to strengthen the validity of the interview it was imperative that there was consistency between written text and oral statements specific to the focus of the research. That was attained by using a member checking technique (Maykut & Morehouse, 1994). Transcripts were given back to Athlete A to verify accuracy and confirm a fair representation of her words. Equally, a second reader was used to support the investigator's interpretations throughout the process.

Following the transcription process, the data was then coded. Maykut and Morehouse (1994), stress the need for data coding during the data collection period in order to eliminate confusion and to identify the various types of data being collected. The coding process involved identifying the type of data, the sources of data, and the page number of the transcript. For example I/AA/10, meant interview with Athlete A, page 10.

The second step in coding of the data is called unitizing the data (Lincoln & Guba, 1985). This procedure involved identifying chunks or units of meaning in the data. As suggested by Lincoln and Guba (1985) each unit of meaning must be able to stand by itself. In other words, any additional information is not necessary except for the main focus of the study. The process of unitizing data suggested by Maykut and Morehouse (1994) is to photocopy the transcribed data, cut apart units of meaning, and tape each unit onto separate index cards. The unitizing process is also described by Kvale (1996) as "meaning condensation" and serves to reduce and clarify large interview texts into briefer and simpler sentences.

The third step in coding data was the discovery phase. This phase was a preliminary step to searching for important and salient information such as meanings and patterns within the data set (Maykut & Morehouse, 1994). The discovery phase initiated categorization of the units of meaning central to the focus of inquiry.

Constant Comparative Method. Content analysis had been defined as, "a research methodology that utilizes a set of procedures to make valid inferences from (the) text. These inferences are about the sender(s) of the message, the message itself, or the audience of the message" (Weber, 1990, p. 9). Content analysis describes trends, reflects patterns, and identifies intentions (Weber, 1990). For the current study the constant comparative method (Glaser & Strauss, 1967) was used to carry out the analysis of the data. This method combined inductive category coding with comparison across all units of meaning obtained. As each new meaning was selected for analysis, it was compared to all other units of meaning and subsequently grouped (categorized and coded) with similar units of meaning. If there were no similar units of meaning, a new category was formed (Maykut & Morehouse, 1994). This process allowed for the continuous refinement of categories. The constant comparative method of data analysis included four steps: (1) inductive category coding and comparison of units of meaning across categories; (2) refinement of categories; (3) exploration of relationships and patterns; and (4) integration of data (Glaser & Strauss, 1967).

The first step of the constant comparative method was inductive category coding. This entailed creating provisional categories by reviewing the discovery sheet made in the coding process and combining any ideas that overlap with one another. Ultimately, the goal of this categorization was to match all the units of meaning to the provisional categories. If there was no provisional category for which a unit of meaning fit within, then a new category was created. The discovery sheet created for this research included words and phrases around psychological and performance states significant to Athlete A (e.g., confidence, preparation, physical, monitoring).

The second step was refining the categories that have been created. The process used to refine the categories was called writing rules of inclusion. The goal of these rules was to filter out the meaning carried in the cards. The rule serves as a basis for including or excluding data in each category. Lincoln and Guba (1985) suggest that when writing rules of inclusion it is best to use propositional statements. How these statements work was that collectively the data under each category name provides the meaning it was intended to convey. For example, a rule of inclusion used for the category of preparation was, Athlete A reflects on improving her physical and mental preparation in order to help her distinguish between feelings of being ready and not ready prior to swim races.

The third step was exploration of relationships and patterns. This step involves analyzing the propositional statements created in the second step. The process undertaken in this step is to study propositional statements that stand alone and those that connect to two or more other propositional statements. Combining these statements into one group was called "outcome propositions" (Maykut & Morehouse, 1994).

The final step of the constant comparative method was integration of the data in order to come to an understanding about the focus of the study. Keeping the focus of inquiry in mind at all times was imperative throughout this process especially when creating and refining the categories, finding relationships and patterns within the data, and writing up the data in a simple and sensible format (Maykut & Morehouse, 1994).

Profiles. In order to simply yet accurately analyze the data gathered from the state instruments (i.e., CSAI-2, MRF, AGI, POMS, and MSRS) across the 16 data points, the scores on each subscale from all the measures were plotted across each swimming performance. Further, to minimize confusion, the data was not only separated between short course and long course performances, it was also categorized according to performance outcome. The short course season was also ranked based on performance outcome from 1 to 11 (1 = fastest and 11 = slowest). Furthermore, the data was split into the top five performances and the bottom five performances to simplify the analysis. Because there were an odd number of data points, the neutral meet (meet "E") was analyzed separately. For the long course season, the data was ranked from one to five (1 = fastest and 5 = slowest) according to performance outcome as illustrated in table 1.

Table 1

Short Course and Long Course Competition Outcome and Ranking

Label	Ranking	Competition	Outcome
A	10	Keyano Cup #1	1:05.73
B	8	Goldfins (H)	1:05.09
C	4	Goldfins (F)	1:03.69
D	11	Keyano Cup #2	1:06.48
E	6	Nationals (H)	1:04.06
F	2	Nationals (F)	1:02.18
*G	5	US Open (H)	1:07.21
H	7	Keyano Cup #3	1:04.92
*I	2	Pan Pacs (H)	1:05.27
*J	1	Pan Pacs (F)	1:04.56
K	9	Westerns (H)	1:05.41
L	3	Westerns (F)	1:02.26
*M	4	Canada Cup (H)	1:07.07
*N	3	Canada Cup (F)	1:06.60
O	5	Senior Champs (H)	1:03.80
P	1	Senior Champs (F)	1:01.80

* denotes long course meets

Upon completion of plotting subscale values on each instrument, relationships and patterns between psychological variables and performance outcomes were noted. Ranges/levels of each construct were determined by dividing the overall score of each subscale by three and assigned labels of low, moderate, and high. Athlete A's overall profile was created using intensity markers of low, moderate, and high. The practical advantage in using low, moderate, and high indicators is that when athletes choose to monitor themselves without the use of psychometric measures, gauging themselves against low, moderate, high would be more practical than using numerical values. In addition to using informal conversational interviews (Morse & Richards, 2002; Patton, 2002) and observations made during competitive periods, relationships between constructs were documented. Factors such as the type and significance of swim meet, situation criticality (i.e., the athlete's perception of the importance of the sporting situation) (Bar-Eli & Tractinsky, 2000), and circumstances surrounding the competition (e.g., sickness or injury) were taken into consideration (Hogg, 2002).

CHAPTER 4

Data Analysis

All of the trait instruments were administered twice throughout the data collection period; once at the beginning of the first training macro (September, 2002) and once again at the end of the second training macro (March, 2003).

The Sport Anxiety Scale (SAS)

In table 2, Athlete A showed moderate levels of cognitive anxiety (15/27), somatic anxiety (14/21), and concentration disruption (7/15). After the second measurement, Athlete A displayed consistent scores with moderate levels again on all three subscales. The scores for the three subscales were: cognitive anxiety (13/27), somatic anxiety (13/21), and concentration disruption (6/15) (See Appendix P).

Table 2

Summary of Subscale Scores across the Season for the Sport Anxiety Scale

	Cognitive Anxiety	Somatic Anxiety	Concentration Disruption
Measure #1 (10/16/02)	15	14	7
Measure #2 (03/24/03)	13	13	6

Overall, Athlete A showed consistent scores between the two measurement points. Specifically, Athlete A's tendency for trait anxiety was to have equal or slightly higher cognitive anxiety than somatic anxiety scores and moderate levels of concentration disruption.

The Causes of Anxiety in Sport Scale (CASS)

Tables 3 and 4 show that the CASS scores are broken down into ten sources of anxiety that had the highest tendency of occurring (frequency), the highest level of intensity, and had caused Athlete A the greatest concern (See Appendix Q).

After the first measurement (three weeks into training), Athlete A indicated factors 1 (ego threat, 15/15), 2 (perceived readiness, 12/15), 3 (skill level, 11/15), 4 (perceived importance, 14/15), 6 (parental expectations, 8/10), 8 (on-going performance, 11/15), and 9 (personal expectations, 8/10) as being causes of anxiety that had the highest frequency. Moderate levels of frequency were factors 5 (social debilitation, 8/15) and 7 (real-life stressors, 9/15). Lower levels of frequency were factor 10 (perceived uncertainty, 4/10).

The factors that had the highest level of intensity were factors 1(ego threat, 10/12), 2 (perceived readiness, 11/12), 4 (perceived importance, 9/12), 7 (real-life stressors, 8/12) 8 (on-going performance, 9/12) and 9 (personal expectations, 7/8). Moderate intensity levels were factors 3 (skill level, 7/12), 5 (social debilitation, 6/12), and 6 (parental expectations, 5/8). Low levels of intensity were factor 10 (perceived uncertainty, 3/8).

In the last category of concern, Athlete A indicated factors 1 (ego threat, 10/15), 2 (perceived readiness, 15/15), 3 (skill level, 10/15), 4 (perceived importance, 15/15), 5 (social debilitation, 10/15), 7 (real-life stressors, 15/15), 8 (on-going performance, 15/15), and 9 (personal expectations, 10/10) as being of most concern. Lower levels of concern were indicated on factors 6 (parental expectations, 5/10) and 10 (perceived uncertainty, 5/10).

Table 3

Summary of Subscale Scores for the First Measure of the Causes of Anxiety in Sport Scale (10/16/02)

	Ego Threat	Readiness	Skill Level	Importance	Debilitation	Parental Expectation	Stress	Performance	Pers. Exp.	Uncertainty
Frequency	15	12	11	14	8	8	9	11	8	4
Intensity	10	11	7	9	6	5	8	9	7	3
Concern	10	15	10	15	10	5	15	15	10	5

After the second measurement (27 weeks into the season), Athlete A indicated factors 1 (ego threat, 12/15), 2 (perceived readiness, 13/15), 4 (perceived importance, 12/15), and 6 (parental expectations, 7/10) as having the highest tendency of occurring (frequency). Moderate levels of frequency were factors 3 (skill level, 9/15), 5 (social debilitation, 7/15), 7 (real-life stressors, 9/15), 8 (on-going performance, 10/15), 9 (personal expectations, 9/15), and 10 (perceived uncertainty, 6/10).

The factors that had the highest level of intensity were factors 1 (ego threat, 10/12), 2 (perceived readiness, 12/12), 4 (perceived importance, 9/12), 6 (parental expectations, 6/8), 7 (real-life stressors, 8/12), 8 (on-going performance, 8/12), and 9 (personal expectations, 6/8). Moderate intensity levels were factors 3 (skill level, 7/12), 5 (social debilitation, 6/12), and 10 (perceived uncertainty, 5/8).

In the last category of concern, Athlete A indicated factor 2 (perceived readiness, 15/15) as being of most concern to her. The rest of the factors: 1 (ego threat, 5/15), 3 (skill level, 0/15), 4 (perceived importance, 0/15), 5 (social debilitation, 0/15), 6 (parental expectations, 0/10), 7 (real-life stressors, 5/15), 8 (on-going performance, 5/15), 9 (personal expectations, 5/10), and 10 (perceived uncertainty, 5/10) were all considered low levels of concern to Athlete A.

Table 4

Summary of Subscale Scores for the Second Measure of the Causes of Anxiety in Sport Scale (03/24/03)

	Ego Threat	Readiness	Skill Level	Importance	Debilitation	Parental Expectation	Stress	Performance	Pers. Exp.	Uncertainty
Frequency	12	13	9	12	7	7	9	10	6	6
Intensity	10	12	7	9	6	6	8	8	6	5
Concern	5	15	0	0	0	0	5	5	5	5

The Carolina Sport Confidence Inventory (CSCI)

Table 5 illustrates that the CSCI consists of two subscales: Dispositional optimism and sport competence. By adding the scores of both these subscales, a total score of sport confidence can be calculated (See Appendix R).

Consistency between the two measures can be found especially on the dispositional optimism scale. Both scores were 24/28 and indicate that Athlete A possesses an expectation that good things will happen. There was a slight increase on the sport competence scale as measure one was 17/24 and measure two was 19/24. This scale measures Athlete A's belief in her skills and abilities to successfully fulfill the demands of the sport. These results directly influence Athlete A's sport confidence scores as her scores increased from 41/52 to 43/52 between measure one and measure two. Based on these results, it can be concluded that Athlete A's general levels of confidence are high within the sport of swimming.

Table 5

Summary of Subscale Scores across the Season for the Carolina Sport Confidence Inventory

	Dispositional Optimism	Sport Competence	Sport Confidence
Measure #1 (10/16/02)	24	17	41
Measure #2 (03/24/03)	24	19	43

The Sport Motivation Scale (SMS)

The SMS consists of three subscales: extrinsic motivation, intrinsic motivation, and amotivation (See Appendix S). Table 6 shows that the subscale of extrinsic motivation had equal scores on both measures (53/84). The extrinsic motivation subscale consists of three types of extrinsic motivation. External regulation (athlete is controlled by external sources), introjection (external sources of motivation have been internalized by the athlete), and identified regulation (athlete values the behavior and participates out of choice). Between the two measures, external regulation remained the same; introjection increased by one point, and identified regulation decreased by one point.

The subscale intrinsic motivation increased by three points between the first and second measurements (53/84 and 56/84 respectively). The intrinsic motivation subscale also includes three types of intrinsic motivation. To know (exploration and curiosity), toward accomplishment (attempting to accomplish or create something), and experience stimulation (experience stimulating sensations). Two types of intrinsic motivation increased from the first measure: To know (13/28 to 17/28) and toward accomplishment (17/28 to 18/28), the third type, experience stimulation decreased from the first to the second measure (23/28 to 21/28).

The subscale of amotivation differed by two points between the first and second measure with scores of 4/28 to 6/28. Although there is a subtle difference, both scores are considered to be low as Athlete A showed that she is both extrinsically and intrinsically motivated to compete in her sport.

Table 6

Summary of the Subscale Scores across the Season for the Sport Motivation Scale

	Extrinsic Motivation	Intrinsic Motivation	Amotivation
Measure #1 (10/16/02)	53	53	4
Measure #2 (03/24/03)	53	56	6

The Recovery-Stress Questionnaire (RESTQ-Sport)

The ideal pattern for this data would be to see lower levels of general stress and sport-specific stress, and higher levels of general recovery and sport-specific recovery closer to and at the time of performance at a major competition. Certainly, this depends heavily on the circumstances and situational events of the training period. The recovery-stress data indicated the following relationships for Athlete A (See Appendix T):

The RESTQ was given to Athlete A four times over the data collection period as determined by her coach. The first measure was given to her one week prior to a national competition to determine whether she had mentally and physically recovered from high volume training in order to perform successfully at the competition. The second measure was given after she had returned from an international training camp and competition. This was given to gauge how she mentally and physically felt after such an intense experience. The third measure was given during a high volume training camp in order to monitor how the training load affected Athlete A's sport specific stress and recovery levels. The fourth measure was given at the end of her second macro cycle to assess her recovery levels after two consecutive major competitions. Table 7 shows Athlete A's scores for all four data collection points.

Table 7

Summary of the Subscale Scores across the Season for the RESTQ-Sport

	Measure #1	Measure #2	Measure #3	Measure #4
General Stress	1.25	4.50	1.25	3.00
Emotional Stress	2.00	3.75	1.50	2.75
Social Stress	1.00	3.75	2.50	3.25
Conflicts/Pressure	3.25	4.00	2.75	3.50
Fatigue	3.50	3.50	2.50	2.50
Lack of Energy	4.00	4.00	2.25	3.25
Somatic Complaints	3.00	3.50	2.25	2.75
Success	2.00	2.00	3.00	1.75
Social Relaxation	4.50	1.75	4.25	2.75
Somatic Relaxation	1.50	1.50	3.00	1.75
General Well-being	4.50	2.00	4.00	2.75
Sleep	5.00	3.75	4.00	3.50
Disturbed Breaks	0.00	0.00	1.00	0.00
Burnout/Emotional Exhaustion	2.25	1.50	1.75	3.50
Fitness/Injury	3.50	2.75	3.25	3.75
Fitness/Being in Shape	2.25	2.25	3.50	2.00
Burnout/Personal Accomplishment	2.25	1.75	3.00	2.25
Self-Efficacy	2.00	1.75	4.00	1.50
Self-Regulation	2.00	1.50	2.75	2.50

In the area of general stress and general recovery over the four data collection points, Athlete A's scores fluctuated. The first measure was taken prior to a national competition and indicated low to moderate levels of general stress and inconsistent levels of general recovery. Specifically, low general stress appeared on the subscales of general stress (1.25), emotional stress (2.00), and social stress (1.00). Moderate levels of general stress appeared on the subscales of conflicts/pressure (3.25), fatigue (3.50), lack of energy (4.00), and somatic complaints (3.00). Basically Athlete A felt more somatic stress versus mental or emotional stress one week prior to her first national competition of the season. In the area of general recovery, lower levels were found on the subscales of success (2.00) and somatic relaxation (1.50). On the other hand, a more positive trend was found for the subscales of social relaxation (4.50), general well being (4.50), and sleep (5.00).

The second measure was taken after a major international training camp and competition (19 weeks into the swim season) and indicated an increase in general stress levels with decreasing general recovery levels. In this instance, all the subscales in the general stress area were above 3.50, which are not ideal. In the area of general recovery, most subscales were in the low to moderate levels except for the subscale of sleep, which dropped to 3.75 from 5.00.

The third measure was taken during a training camp (21 weeks into the swim season) and displayed an encouraging trend with general stress decreasing and general recovery increasing. Although, the levels were mostly moderate in both the general stress (1.25-2.75) and the general recovery (3.00-4.25) areas, the movement towards improvement was being made.

The fourth measure was taken at the end of the season (25 weeks into the swim season) after an emotional long course meet. Specifically, Athlete A's general stress increased to moderate levels and her general recovery decreased from moderate to low levels.

In the area of sport-specific stress and sport-specific recovery, again Athlete A's scores fluctuated over the four data collection points. The first measure indicated moderate levels of stress especially on the subscales of burnout/emotional exhaustion

(2.25) and fitness/injury (3.50). These two subscales relate not only to emotional fatigue but also to physical fatigue and soreness. This data was supported by the pattern of somatic complaints and somatic relaxation found in the general stress and general recovery areas of the RESTQ. Sport-specific recovery indicated moderate levels across all four subscales in this category (fitness/being in shape, 2.25; burnout/personal accomplishment, 2.25; self-efficacy, 2.00; self-regulation, 2.00).

The second measure indicated low to moderate levels of sport-specific stress, which is a good sign since this measure was taken after an international training camp and competition. Unfortunately, Athlete A's sport-specific recovery is quite low indicating that perhaps recovering from the mental/emotional and physical stress of the camp and competition had not yet occurred.

The third measure also shows a fluctuation in Athlete A's sport-specific stress as all three subscales increased somewhat. In this instance, the pattern would be fairly typical as this measure was taken during a high volume training camp in Hawaii. Fortunately, Athlete A shows an increase in her ability to cope with this type of training as her sport-specific recovery scores have increased from low to moderate levels. This is especially true for the subscale self-efficacy (1.75 to 4.00). This may reflect her belief in her ability to successfully meet the demands of the training camp.

The fourth measure showed the opposite trend. After a very emotional long course meet, Athlete A demonstrated the biggest increase in the subscale burnout/emotional exhaustion (1.75 to 3.50) in the category of sport-specific stress. With this increase in stress, again Athlete A appeared to lack the necessary coping responses as her sport-specific recovery decreases. This seems most evident with the subscale self-efficacy where the drop is quite significant (4.00 to 1.50).

The following analysis of state measures includes cognitive and somatic anxiety, confidence, concentration, motivation, mood states, and post performance debriefing.

Cognitive Anxiety

CSAI-2. Table 8 shows that overall, Athlete A's pre-performance cognitive anxiety ranged from 3-23 out of 27 (See Appendix U). For Athlete A's short course season, her levels of cognitive anxiety were low to moderate and for her long course season they were moderate to high. This clearly indicates a distinct difference in her perceptions of short course and long course swimming and racing.

Table 8

Summary of Cognitive Anxiety Subscale Scores (CSAI-2) across the Season

Label	Ranking	Meet	Outcome	Cognitive Anxiety
A	10	Keyano Cup #1	1:05.73	11
B	8	Goldfins (H)	1:05.09	7
C	4	Goldfins (F)	1:03.69	6
D	11	Keyano Cup #2	1:06.48	7
E	6	Nationals (H)	1:04.06	20
F	2	Nationals (F)	1:02.18	11
*G	5	US Open (H)	1:07.21	9
H	7	Keyano Cup #3	1:04.92	8
*I	2	Pan Pacs (H)	1:05.27	23
*J	1	Pan Pacs (F)	1:04.56	17
K	9	Westerns (H)	1:05.41	5
L	3	Westerns (F)	1:02.26	13
*M	4	Canada Cup (H)	1:07.07	16
*N	3	Canada Cup (F)	1:06.60	9
O	5	Senior Champs (H)	1:03.80	9
P	1	Senior Champs (F)	1:01.80	3
* Denotes long course meets			Range	3-23

Athlete A's top five short course performances (meets C, F, L, O, and P) indicated a cognitive anxiety range of 3-13 out of 27. Although the range is quite high, her top performance where she achieved a best time (meet "P") occurred when her pre performance cognitive anxiety was the lowest (3). Athlete A's bottom five short course performances (meets A, B, D, H, and K) had a cognitive anxiety range of 5-11 out of 27. These performances just like her top five performances show a low-moderate range of pre performance cognitive anxiety.

Meet "E" which was ranked 6th based on outcome displayed a pre performance cognitive anxiety score of 20/27. This level is quite high for a short course performance and is reflected not only in the importance of the meet which was a national heat race, but also in the outcome where she was more than two seconds off her best time. This disappointing result did not qualify her for the A-final, rather the B-final.

During Athlete A's long course meets (G, I, J, M, and N), her pre performance cognitive anxiety scores are much higher (moderate to high levels). The range for these scores was 9-23 out of 27. The higher cognitive anxiety scores occurred at an international meet (heat and final races) (meet "I" and "J") that Athlete A participated in. In contrast to her short course season, Athlete A's top two performances occurred at this international meet where she displayed higher levels of cognitive anxiety prior to performing.

MRF. Table 9 demonstrates that overall, Athlete A's pre performance cognitive anxiety ranged from 1.1-7.0 out of 10 on the MRF questionnaire (See Appendix V). Across all data points, her scores are within the low to high range of cognitive anxiety. Her lowest cognitive anxiety scores occurred during her short course season (meets "K" and "P") and her highest occurred during one short course meet ("E") and one long course meet ("I").

Table 9

Summary of Cognitive Anxiety Subscale Scores (MRF) across the Season

Label	Ranking	Meet	Outcome	Cognitive Anxiety
A	10	Keyano Cup #1	1:05.73	2.8
B	8	Goldfins (H)	1:05.09	3.9
C	4	Goldfins (F)	1:03.69	4.4
D	11	Keyano Cup #2	1:06.48	2.3
E	6	Nationals (H)	1:04.06	7.0
F	2	Nationals (F)	1:02.18	3.0
*G	5	US Open (H)	1:07.21	2.0
H	7	Keyano Cup #3	1:04.92	2.0
*I	2	Pan Pacs (H)	1:05.27	7.0
*J	1	Pan Pacs (F)	1:04.56	2.0
K	9	Westerns (H)	1:05.41	1.1
L	3	Westerns (F)	1:02.26	2.0
*M	4	Canada Cup (H)	1:07.07	4.3
*N	3	Canada Cup (F)	1:06.60	1.4
O	5	Senior Champs (H)	1:03.80	2.0
P	1	Senior Champs (F)	1:01.80	1.1

* Denotes long course meets Range 1.1-7.0

During Athlete A's short course season, her top five performances (meets C, F, L, O, and P), indicated a low to moderate range of pre performance cognitive anxiety which was 1.1-4.4 out of 10. The lowest score (1.1) was at meet "P" in which she achieved a best time of the season. The highest cognitive anxiety score of 4.4 out of 10 occurred during her fourth best performance (meet "C"). During Athlete A's bottom five performances of her short course season (meets A, B, D, H, and K), her pre performance cognitive anxiety also ranged in the low to moderate levels with scores of 1.1-3.9 out of 10.

Athlete A's 6th ranked performance (meet "E") indicated the highest score of 7.0 out of 10 on the MRF scale. This score, like the high score on the CSAI-2 scale may be a reflection of the type of meet as both instruments were completed in the pre performance setting.

Athlete A's long course season (meets G, I, J, M, and N), had a much bigger range of scores of 1.4-7.0 out of 10. The highest cognitive anxiety score occurred at her first performance at an international meet (heat swim) and the lowest score occurred at her second performance (final swim) at a national swim meet.

AGI. Table 10 shows that overall, Athlete A's pre performance levels of anxiety/certainty ranged from 6.6-9.6 out of 10 (See Appendix W). Across the season, her levels of anxiety/certainty remain within the high range regardless of outcome or type/importance of the swim meet.

Table 10

Summary of Anxiety/Certainty Subscale Scores (AGI) across the Season

Label	Ranking	Meet	Outcome	Anxiety/Certainty
A	10	Keyano Cup #1	1:05.73	8.0
B	8	Goldfins (H)	1:05.09	8.5
C	4	Goldfins (F)	1:03.69	9.3
D	11	Keyano Cup #2	1:06.48	7.0
E	6	Nationals (H)	1:04.06	6.6
F	2	Nationals (F)	1:02.18	9.0
*G	5	US Open (H)	1:07.21	9.0
H	7	Keyano Cup #3	1:04.92	9.0
*I	2	Pan Pacs (H)	1:05.27	8.0
*J	1	Pan Pacs (F)	1:04.56	8.0
K	9	Westerns (H)	1:05.41	8.6
L	3	Westerns (F)	1:02.26	8.5
*M	4	Canada Cup (H)	1:07.07	7.4
*N	3	Canada Cup (F)	1:06.60	8.2
O	5	Senior Champs (H)	1:03.80	9.0
P	1	Senior Champs (F)	1:01.80	9.6

* Denotes long course meets — Range 6.6-9.6

During Athlete A's top five short course performances (meets C, F, L, O, and P), her anxiety/certainty levels ranged from 8.5-9.6 out of 10. In other words, prior to these performances, her thoughts tended to be much more positive with uncertainty and doubt reduced to a minimum. On the other hand, during Athlete A's bottom five short course performances (meets A, B, D, H, and K), although her levels of anxiety/certainty were moderate-high (7.0-9.0), the range was a little lower than during her top performances; possibly this indicates, that she may have felt some uncertainty going into each one of these performances. Her lowest score (meet "D" = 7.0) was also her worst performance during her short course season.

Athlete A's neutral performance (meet "E") reflected a score of 6.6 out of 10; across the season, this is the lowest pre performance anxiety/certainty score.

Athlete A's long course performances (meets G, I, J, M, and N), also indicated high scores with a range of 7.4-9.0. Again, the range is still low in comparison to her best performance scores in the short course meets. Although the lowest score of 7.4 occurred during her fourth fastest performance, the highest score of 9.0 occurred during her fifth fastest performance.

Somatic Anxiety

CSAI-2. Table 11 illustrates that overall, Athlete A's pre performance somatic anxiety ranged from 3-13 out of 27 (See Appendix X). Whether short course or long course swimming and no matter the outcome of performance, Athlete A's pre performance somatic anxiety remained in the low to moderate range.

Table 11

Summary of Somatic Anxiety Subscale Scores (CSAI-2) across the Season

Label	Ranking	Meet	Outcome	Somatic Anxiety
A	10	Keyano Cup #1	1:05.73	7
B	8	Goldfins (H)	1:05.09	7
C	4	Goldfins (F)	1:03.69	11
D	11	Keyano Cup #2	1:06.48	6
E	6	Nationals (H)	1:04.06	12
F	2	Nationals (F)	1:02.18	13
*G	5	US Open (H)	1:07.21	6
H	7	Keyano Cup #3	1:04.92	3
*I	2	Pan Pacs (H)	1:05.27	11
*J	1	Pan Pacs (F)	1:04.56	9
K	9	Westerns (H)	1:05.41	4
L	3	Westerns (F)	1:02,26	9
*M	4	Canada Cup (H)	1:07.07	10
*N	3	Canada Cup (F)	1:06.60	5
O	5	Senior Champs (H)	1:03.80	6
P	1	Senior Champs (F)	1:01.80	8
* Denotes long course meets			Range	3-13

During Athlete A's top five short course performances (meets C, F, L, O, and P), her somatic anxiety ranged from 6-13 out of 27 with her top two performances having low and moderate levels of somatic anxiety (meet "F" = 13 and meet "P" = 8.). In contrast, Athlete A's bottom five performances (meets A, B, D, H, and K), revealed a range that was lower than her top five performances (3-7 out of 27).

Athlete A's neutral performance (meet "E") revealed a moderate score of 12 out of 27. Unlike meet "F" where her score was 13 out of 27 and she achieved a best time, meet "E" did not result in a very desirable outcome.

Athlete A's long course season (meets G, I, J, M, and N), indicated that her somatic anxiety ranges from 5-11 out of 27 with the top two performances having somatic anxiety in the moderate range (meet "J" = 9 and meet "I" = 11).

MRF. Table 12 shows that in general, Athlete A's pre performance somatic anxiety levels ranged from 1.1-7.1 out of 10 (See Appendix Y).

Table 12

Summary of Somatic Anxiety Subscale Scores (MRF) across the Season

Label	Ranking	Meet	Outcome	Somatic Anxiety
A	10	Keyano Cup #1	1:05.73	1.8
B	8	Goldfins (H)	1:05.09	2.1
C	4	Goldfins (F)	1:03.69	2.6
D	11	Keyano Cup #2	1:06.48	2.0
E	6	Nationals (H)	1:04.06	7.0
F	2	Nationals (F)	1:02.18	2.0
*G	5	US Open (H)	1:07.21	4.0
H	7	Keyano Cup #3	1:04.92	2.1
*I	2	Pan Pacs (H)	1:05.27	7.1
*J	1	Pan Pacs (F)	1:04.56	1.9
K	9	Westerns (H)	1:05.41	2.0
L	3	Westerns (F)	1:02.26	2.0
*M	4	Canada Cup (H)	1:07.07	4.0
*N	3	Canada Cup (F)	1:06.60	1.4
O	5	Senior Champs (H)	1:03.80	3.1
P	1	Senior Champs (F)	1:01.80	1.1
* Denotes long course meets			Range	1.1-7.1

Overall, during her short course season, Athlete A's levels of somatic anxiety were within the low to slightly moderate range, whereas, during her long course season, her somatic anxiety ranged from low to high.

Throughout Athlete A's top five short course performances (meets C, F, L, O, and P), her pre performance somatic anxiety was low to slightly moderate with a range of 1.1-3.1 out of 10. Her two best performances (meet "F" and "P") reflected somatic anxiety levels of 2 and 1.1 out of 10 respectively. Athlete A's bottom five short course performances (meets A, B, D, H, and K), showed overall low levels of somatic anxiety with a range of 1.8-2.1 out of 10. These results are quite consistent across her five worst performances.

Athlete A's 6th ranked performance (meet "E") revealed a higher level of somatic anxiety of 7 out of 10. Out of her short course performances, meet "E" displays the highest level but does not necessarily reflect the worst performance.

Athlete A's long course season results (meets G, I, J, M, and N), indicate a large range (1.4-7.1) from low to high levels of pre performance somatic anxiety. The lower levels of somatic anxiety occurred during final swims at both international and national swim meets ("J" and "N"). The moderate to high levels of somatic anxiety occurred during heat swims at again both international and nationals swim meets ("G" and "M"). The highest level of somatic anxiety occurred at her first swim (heat swim) during a very important international swim meet ("I"), which was also her second best performance during the long course season. In addition, her top performance also occurred at the same international meet during her final swim ("J"), which revealed a much lower level of pre performance somatic anxiety at 1.9 out of 10.

Confidence

CSAI-2. Table 13 shows that overall, Athlete A's pre performance self-confidence ranged from 11-23 out of 27 (See Appendix Z), indicating she was in the moderate to high levels of confidence regardless of outcome or type of meet.

Table 13

Summary of Self-Confidence Subscale Scores (CSAI-2) across the Season

Label	Ranking	Meet	Outcome	Self-Confidence
A	10	Keyano Cup #1	1:05.73	16
B	8	Goldfins (H)	1:05.09	18
C	4	Goldfins (F)	1:03.69	17
D	11	Keyano Cup #2	1:06.48	13
E	6	Nationals (H)	1:04.06	11
F	2	Nationals (F)	1:02.18	17
*G	5	US Open (H)	1:07.21	18
H	7	Keyano Cup #3	1:04.92	18
*I	2	Pan Pacs (H)	1:05.27	14
*J	1	Pan Pacs (F)	1:04.56	18
K	9	Westerns (H)	1:05.41	19
L	3	Westerns (F)	1:02.26	18
*M	4	Canada Cup (H)	1:07.07	11
*N	3	Canada Cup (F)	1:06.60	18
O	5	Senior Champs (H)	1:03.80	16
P	1	Senior Champs (F)	1:01.80	23
* Denotes long course meets			Range	11-23

Specifically, during Athlete A's top five short course performances (meets C, F, L, O, and P), her confidence ranged from 16-23 out of 27. In two of those meets ("F" and "P"), she achieved a best time, which are reflective in her high levels of pre performance confidence, 17 and 23 respectively. During Athlete A's bottom five short course performances (meets A, B, D, H, and K), her self-confidence ranged from 13-19 out of 27. Lower levels of confidence in this instance occurred at local club meets whereas slightly higher levels of confidence occurred during more important and higher level swim meets.

During meet "E" which was Athlete A's 6th ranked performance, she entered a heat swim at a national level competition with a pre performance confidence score of 11 out of 27.

Athlete A's long course performances (meets G, I, J, M, and N), revealed a range of confidence of 11-18 out of 27. Lower levels of confidence occurred during heat swims while higher levels of confidence occurred during final swims.

MRF. Table 14 demonstrates that overall, Athlete A's pre performance self-confidence scores ranged from 6.0-10 out of 10 on the MRF scale and across the season (See Appendix AA), her scores fit within the moderate to high range of confidence.

Table 14

Summary of Self-Confidence Subscale Scores (MRF) across the Season

Label	Ranking	Meet	Outcome	Self-Confidence
A	10	Keyano Cup #1	1:05.73	8.7
B	8	Goldfins (H)	1:05.09	8.7
C	4	Goldfins (F)	1:03.69	8.8
D	11	Keyano Cup #2	1:06.48	6.9
E	6	Nationals (H)	1:04.06	6.1
F	2	Nationals (F)	1:02.18	9.0
*G	5	US Open (H)	1:07.21	7.0
H	7	Keyano Cup #3	1:04.92	9.0
*I	2	Pan Pacs (H)	1:05.27	6.0
*J	1	Pan Pacs (F)	1:04.56	8.0
K	9	Westerns (H)	1:05.41	9.0
L	3	Westerns (F)	1:02.26	8.0
*M	4	Canada Cup (H)	1:07.07	7.5
*N	3	Canada Cup (F)	1:06.60	9.1
O	5	Senior Champs (H)	1:03.80	8.0
P	1	Senior Champs (F)	1:01.80	10
* Denotes long course meets			Range	6.0-10

Athlete A's top five performances during her short course season (meets C, F, L, O, and P), indicate high levels of confidence within a range of 8-10 out of 10. Her top two performances where she achieved her best times (meets "F" and "P") reflect the highest levels of confidence prior to her performances with a 9 and 10 out of 10 respectively. During Athlete A's bottom five short course performances (meets A, B, D, H, and K), her pre performance confidence levels are within moderately-high to high levels of confidence with a range of 6.9-9.0 out of 10. These levels are quite consistent across these five meets with the exception of meet "B" where her confidence was quite low by comparison (6.9).

Athlete A's neutral performance (meet "E") revealed a moderate level of confidence of 6.1 out of 10. In comparison to her top short course performances, this is quite low and reflected in her performance outcome. However, in comparison to her bottom short course performances, this score is quite low yet the outcome is much better as it is her 6th best performance of her short course season.

The largest range in pre performance confidence occurred during Athlete A's long course meets (G, I, J, M, and N) where she ranged from 6.0-9.1 out of 10. The pattern within these data points is that during her heat swims, her confidence tends to be lower (6.0-7.5) whereas during final swims, her confidence tends to be higher (8.0-9.1).

AGI. Table 15 shows that overall, Athlete A's levels of pre performance confidence/pride ranged from 6.3-9.7 out of 10 on the athlete-generated checklist (See Appendix BB) and across all the meets, Athlete A's confidence/pride levels remained high.

Table 15

Summary of Confidence/Proud Subscale Scores (AGI) across the Season

Label	Ranking	Meet	Outcome	Confidence/Proud
A	10	Keyano Cup #1	1:05.73	8.0
B	8	Goldfins (H)	1:05.09	8.8
C	4	Goldfins (F)	1:03.69	8.3
D	11	Keyano Cup #2	1:06.48	7.0
E	6	Nationals (H)	1:04.06	8.0
F	2	Nationals (F)	1:02.18	8.0
*G	5	US Open (H)	1:07.21	6.3
H	7	Keyano Cup #3	1:04.92	9.0
*I	2	Pan Pacs (H)	1:05.27	8.9
*J	1	Pan Pacs (F)	1:04.56	9.5
K	9	Westerns (H)	1:05.41	8.1
L	3	Westerns (F)	1:02.26	9.0
*M	4	Canada Cup (H)	1:07.07	6.4
*N	3	Canada Cup (F)	1:06.60	7.6
O	5	Senior Champs (H)	1:03.80	8.0
P	1	Senior Champs (F)	1:01.80	9.7
* Denotes long course meets			Range	6.3-9.7

During Athlete A's top five short course performances (meets C, F, L, O, and P), her confidence/pride levels ranged from 8.0-9.7 out of 10. The higher end of this range (i.e., 9.7) occurred where she achieved her best time of the season (meet "P"). Athlete A's bottom five short course performances (meets A, B, D, H, and K) also had a high range of confidence/pride scores of 7.0-9.0 out of 10. This range is considered high based on the total score being out of 10 but in comparison to her top performances, this range is a little lower.

Meet "E" was a very important national swim meet and Athlete A's score of 8 out of 10 reflects her sense of pride for attending a meet of this magnitude. Meet "F" is the same national meet, which reflected an equal score of 8 out of 10.

Athlete A's long course season meets (G, I, J, M, and N) indicated a large range of confidence/pride levels of 6.3-9.5 out of 10. In support of Athlete A's definition of confidence, it is evident that the higher levels of confidence/pride (8.9 and 9.5) were felt at the international meet she attended where she represented her country for the first time in her swimming career.

Concentration

AGI. Table 16 shows that Athlete A's concentration/focus/readiness levels ranged from 3.0 to 9.7 across the season (See Appendix CC).

Table 16

Summary of Concentration/Focused/Readiness Subscale Scores (AGI) across the Season

Label	Ranking	Meet	Outcome	Concentration
A	10	Keyano Cup #1	1:05.73	5.2
B	8	Goldfins (H)	1:05.09	6.8
C	4	Goldfins (F)	1:03.69	9.4
D	11	Keyano Cup #2	1:06.48	3.0
E	6	Nationals (H)	1:04.06	6.0
F	2	Nationals (F)	1:02.18	9.0
*G	5	US Open (H)	1:07.21	7.9
H	7	Keyano Cup #3	1:04.92	7.3
*I	2	Pan Pacs (H)	1:05.27	6.9
*J	1	Pan Pacs (F)	1:04.56	8.1
K	9	Westerns (H)	1:05.41	8.1
L	3	Westerns (F)	1:02.26	8.2
*M	4	Canada Cup (H)	1:07.07	7.0
*N	3	Canada Cup (F)	1:06.60	8.0
O	5	Senior Champs (H)	1:03.80	7.4
P	1	Senior Champs (F)	1:01.80	9.7
* Denotes long course meets			Range	3.0-9.7

Athlete A's top five short course performances (meets C, F, L, O, and P) have a high range of 7.4-9.7 out of 10 on the athlete-generated checklist. Her top two performances (meets "F" and "P") exhibit scores higher in the range at 9.0 and 9.7 respectively. Athlete A's bottom five performances during her short course season (meets A, B, D, H, and K) indicate moderate to high levels of pre performance concentration/focus/readiness with a wide range from 3.0-8.0 out of 10. The lower scores generally are exhibited at local club meets as well as less competitive provincial meets.

Meet "E" reflected a moderate level of pre performance concentration/focus/readiness with a score of 6 out of 10. This score may reflect in the outcome although inconsistencies do exist as some of her poorer short course performances indicate higher levels of concentration/focus/readiness prior to competing.

During Athlete A's long course season (meets G, I, J, M, and N), her concentration/focus/readiness prior to performance ranged from 6.9-8.1 out of 10, which is within the high range on the athlete-generated checklist. Athlete A's top performance during her long course season (meet "J") exhibited the highest level of concentration/focus/readiness. Although her second best performance (meet "I") showed the lowest level of pre performance concentration/focus/readiness, at 6.9, the other meets followed Athlete A's tendency to have a positive relationship between pre performance concentration/focus/readiness and outcome.

Motivation

AGI. As shown in table 17, overall, Athlete A's pre performance motivation/drive levels range from 5.0-9.7 out of 10 (See Appendix DD), which is within the moderate to high levels on the athlete-generated checklist.

Table 17

Summary of Motivation/Driven Subscale Scores (AGI) across the Season

Label	Ranking	Meet	Outcome	Motivation/Drive
A	10	Keyano Cup #1	1:05.73	6.0
B	8	Goldfins (H)	1:05.09	7.3
C	4	Goldfins (F)	1:03.69	8.2
D	11	Keyano Cup #2	1:06.48	5.0
E	6	Nationals (H)	1:04.06	6.0
F	2	Nationals (F)	1:02.18	9.0
*G	5	US Open (H)	1:07.21	6.1
H	7	Keyano Cup #3	1:04.92	8.9
*I	2	Pan Pacs (H)	1:05.27	7.9
*J	1	Pan Pacs (F)	1:04.56	9.5
K	9	Westerns (H)	1:05.41	7.0
L	3	Westerns (F)	1:02.26	9.0
*M	4	Canada Cup (H)	1:07.07	6.5
*N	3	Canada Cup (F)	1:06.60	8.3
O	5	Senior Champs (H)	1:03.80	7.5
P	1	Senior Champs (F)	1:01.80	9.7
* Denotes long course meets			Range	5.0-9.7

During her top five short course performances (meet C, F, L, O, and P), her motivation/drive levels ranged between 7.5 and 9.7. Her top two performances (meets "F" and "P") reflected high levels of drive at 9.0 and 9.7 respectively. Athlete A's bottom five performances in the short course season (meets A, B, D, H, and K) had a much larger range of 5.0-8.9 out of 10, indicating moderate to high levels of motivation/drive in the pre performance setting. The lower levels of motivation/drive (5.0, 6.0, and 7.3) all occurred at local club meets or meets that Athlete A deemed as less important.

Athlete A's 6th ranked performance (meet "E") being a national level competition surprisingly reflected a moderate level of pre performance motivation/drive with a score of 6 out of 10. Consistent with Athlete A's other important meets, she displayed a lower score during her heat swim and a higher score during her final swim (meet "F" = 9).

During Athlete A's long course season (meets G, I, J, M, and N), her motivation/drive levels were also moderate to high with a range of 6.1-9.5 out of 10. The higher scores of 8.3 and 9.5 occurred prior to final swims at international and national level competitions, whereas, the lower levels of motivation/drive appeared during heat swims at the same international and national level competitions.

Mood States

In addition to monitoring each of the seven mood states (vigor, tension, anger, confusion, fatigue, depression, confidence) in the pre performance setting, Athlete A was asked to indicate how important the upcoming performance was to her as well as how competent she felt in terms of performing in the race. The scores were out of six for both questions as shown in table 18.

Table 18

Summary of Importance and Competence Scores (Pre POMS) across the Season

Label	Ranking	Meet	Importance (/6)	Competence (/6)
A	10	Keyano Cup #1	1	3
B	8	Goldfins (H)	3	4
C	4	Goldfins (F)	4	5
D	11	Keyano Cup #2	1	3
E	6	Nationals (H)	5	3
F	2	Nationals (F)	5	5
*G	5	US Open (H)	4	5
H	7	Keyano Cup #3	3	4
*I	2	Pan Pacs (H)	4	3
*J	1	Pan Pacs (F)	5	4
K	9	Westerns (H)	4	4
L	3	Westerns (F)	5	5
*M	4	Canada Cup (H)	4	3
*N	3	Canada Cup (F)	4	5
O	5	Senior Champs (H)	3	3
P	1	Senior Champs (F)	5	5

* Denotes long course meets

The general results indicated that Athlete A deemed higher-level competitions and final swims as more important than lower level competitions and heat swims. In terms of competence, Athlete A demonstrated that prior to more important performances, she felt more competent.

Pre/Post Vigor. Table 19 shows that overall, Athlete A's pre vigor scores ranged from 9-15 out of 20 and her post vigor scores ranged from 5-15 out of 20 (See Appendix EE). The vigor subscale tends to reflect higher scores in comparison to the other subscales (except confidence) in both pre and post performance settings.

Table 19

Summary of Pre/Post Vigor (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Vigor (20)	Post Vigor (20)
A	10	Keyano Cup #1	1:05.73	14	12
B	8	Goldfins (H)	1:05.09	15	14
C	4	Goldfins (F)	1:03.69	14	12
D	11	Keyano Cup #2	1:06.48	13	11
E	6	Nationals (H)	1:04.06	15	13
F	2	Nationals (F)	1:02.18	15	15
*G	5	US Open (H)	1:07.21	10	10
H	7	Keyano Cup #3	1:04.92	15	14
*I	2	Pan Pacs (H)	1:05.27	9	9
*J	1	Pan Pacs (F)	1:04.56	11	5
K	9	Westerns (H)	1:05.41	15	5
L	3	Westerns (F)	1:02.26	14	15
*M	4	Canada Cup (H)	1:07.07	9	6
*N	3	Canada Cup (F)	1:06.60	13	14
O	5	Senior Champs (H)	1:03.80	10	13
P	1	Senior Champs (F)	1:01.80	14	13
* Denotes long course meets			Range	9-15	5-15

In Athlete A's short course season, her top five performances (meets C, F, L, O and P) reflected pre vigor scores ranging from 10-15 and her post vigor scores ranging from 12-15. Her vigor scores are quite consistent between pre and post with the highest difference of 3 points for meet "O". Although there is no definitive pattern, her vigor scores tend to be moderately high for both pre and post performance with her post vigor scores generally being higher than her pre vigor. Athlete A's bottom five short course performances (meet A, B, D, H, and K) reflect pre vigor scores ranging from 13-15 and post vigor scores ranging from 5-14. These scores generally indicated that her pre vigor scores are slightly higher than her post vigor scores with the exception of meet "K" where the difference between her pre vigor and post vigor was 10 points.

Meet "E" revealed a pre vigor score of 15 out of 20 and a post vigor score of 13 out of 20. Like her poor performances where her vigor levels decreased in the post performance setting, the same occurs for her 6th ranked performance, which may be a reflection of the outcome.

During Athlete A's long course season (meets G, I, J, M, and N), her pre vigor scores ranged from 9-13 out of 20 and her post vigor scores ranged from 5-14 out of 20. Her vigor scores seem quite consistent between pre and post performance with the exception of meet "J" where her vigor dropped 6 points between pre and post performance. This could potentially reflect not only the importance of the meet but also the outcome as it was an international meet and a final swim for Athlete A.

Pre/Post Tension. In general, table 20 shows that Athlete A's pre performance tension scores ranged from 0-9 out of 24 and her post performance tension scores ranged from 1-12 out of 24 (See Appendix FF).

Table 20

Summary of Pre/Post Tension (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Tension (24)	Post Tension (24)
A	10	Keyano Cup #1	1:05.73	0	2
B	8	Goldfins (H)	1:05.09	4	1
C	4	Goldfins (F)	1:03.69	4	3
D	11	Keyano Cup #2	1:06.48	7	7
E	6	Nationals (H)	1:04.06	9	10
F	2	Nationals (F)	1:02.18	9	4
*G	5	US Open (H)	1:07.21	6	5
H	7	Keyano Cup #3	1:04.92	3	4
*I	2	Pan Pacs (H)	1:05.27	6	8
*J	1	Pan Pacs (F)	1:04.56	6	9
K	9	Westerns (H)	1:05.41	8	9
L	3	Westerns (F)	1:02.26	7	4
*M	4	Canada Cup (H)	1:07.07	8	12
*N	3	Canada Cup (F)	1:06.60	7	7
O	5	Senior Champs (H)	1:03.80	8	3
P	1	Senior Champs (F)	1:01.80	3	3
* Denotes long course meets			Range	0-9	1-12

The pre performance tension scores ranged from 4-9 during Athlete A's top five short course performances (meets C, F, L, O, and P) and her post performance tension scores ranged from 3-4. The highest difference between her pre and post scores was 5 points with a general tendency for the pre tension scores to be higher than the post tension scores. This pattern seems natural as Athlete A may feel more tension or pressure prior to competing. The only exception was meet "P" where her pre and post tension scores were equal at 3.

During Athlete A's bottom five short course performances (meets A, B, D, H, and K), her pre tension scores ranged from 0-8 and her post tension scores ranged from 1-9. Specifically, meets "A, "H, and "K" had pre tension scores lower than post tension scores, meet “B” had higher pre tension than post tension scores, and meet “D” had equal pre and post tension scores.

Meet “E” revealed a pre tension score of 9 and a post tension score of 10. Being a national competition, it seems natural for Athlete A to have a moderate level of pre tension. As a consequence of a poor result, Athlete A continued to display a moderate level of post tension.

Athlete A’s long course season meets (G, I, J, M, and N) had pre performance tension scores ranging from 6-8 and post tension performance scores ranging from 5-12. The biggest difference was 4 points, which occurred during meet “M” with pre tension being 8 and post tension being 12. Regardless of outcome, meet “M” was a very emotional meet for Athlete A as factors such as teammates leaving the club, distractions of school, and turbulent times with her significant other may have reflected in the post tension score. With the exceptions of meet “N” where pre and post tension scores were equal and meet “G” where pre tension was higher than post tension, meets “I”, “J”, and “M” reflected higher post tension scores than pre tension scores.

Pre/Post Anger. As shown in table 21, Athlete A’s pre anger scores ranged from 0-8 out of 24 while her post anger scores ranged from 0-17 out of 24 (See Appendix GG).

Table 21

Summary of Pre/Post Anger (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Anger (24)	Post Anger (24)
A	10	Keyano Cup #1	1:05.73	1	9
B	8	Goldfins (H)	1:05.09	0	1
C	4	Goldfins (F)	1:03.69	3	0
D	11	Keyano Cup #2	1:06.48	5	7
E	6	Nationals (H)	1:04.06	8	15
F	2	Nationals (F)	1:02.18	7	1
*G	5	US Open (H)	1:07.21	2	17
H	7	Keyano Cup #3	1:04.92	2	1
*I	2	Pan Pacs (H)	1:05.27	2	13
*J	1	Pan Pacs (F)	1:04.56	4	13
K	9	Westerns (H)	1:05.41	5	12
L	3	Westerns (F)	1:02.26	7	3
*M	4	Canada Cup (H)	1:07.07	8	19
*N	3	Canada Cup (F)	1:06.60	4	7
O	5	Senior Champs (H)	1:03.80	7	4
P	1	Senior Champs (F)	1:01.80	1	1
* Denotes long course meets			Range	0-8	0-17

Throughout Athlete A's short course season, her top five performances were meets C, F, L, O, and P. The range for her pre anger scores during her top five performances was 1-7 and the range for her post anger scores was 0-4. The pattern for her top performances tended to show that her pre anger scores were higher than her post anger scores. Her top five performances were generally in final swims which took place during the night portion of a swim meet. Only one meet ("O") was a heat swim. In contrast, throughout Athlete A's short course season performances, her bottom five performances were meets A, B, D, H, and K. Three out of these five meets were club meets ("A", "D", and "H") which Athlete A deemed as less important than the others. The range for her pre anger scores during her bottom five performances was 0-5 and the range for her post anger scores was 1-12. The tendency for her five worst performances was that her post anger scores tended to be higher than her pre anger scores.

Athlete A's neutral performance (meet "E") showed a pre anger score of 8 out of 24 and a post anger score of 15 out of 24. Again, the dramatic increase in anger in the post performance setting could be reflective of the disappointment she felt in the outcome of her performance as her time did not qualify her for the A-final but rather the B-final.

During Athlete A's long course season (meets G, I, J, M, and N), her pre and post anger scores tended to be much more extreme. Her pre anger scores ranged from 2-8 and her post anger scores ranged from 7-19. The largest difference between her pre and post anger scores occurred during meet "G" where her pre anger was 2 and her post anger was 17. This could reflect not only the outcome of the race but also that this meet was extremely important as it was an international meet where Athlete A wanted to perform very well and did not.

Pre/Post Confusion. Overall table 22 shows that Athlete A's pre confusion scores ranged from 1-7 out of 20 and her post confusion scores ranged from 0-11 out of 20 (See Appendix HH).

Table 22

Summary of Pre/Post Confusion (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Confusion (20)	Post Confusion (20)
A	10	Keyano Cup #1	1:05.73	3	5
B	8	Goldfins (H)	1:05.09	1	2
C	4	Goldfins (F)	1:03.69	2	0
D	11	Keyano Cup #2	1:06.48	4	4
E	6	Nationals (H)	1:04.06	6	9
F	2	Nationals (F)	1:02.18	6	3
*G	5	US Open (H)	1:07.21	3	9
H	7	Keyano Cup #3	1:04.92	4	3
*I	2	Pan Pacs (H)	1:05.27	3	9
*J	1	Pan Pacs (F)	1:04.56	4	8
K	9	Westerns (H)	1:05.41	5	4
L	3	Westerns (F)	1:02.26	3	2
*M	4	Canada Cup (H)	1:07.07	7	11
*N	3	Canada Cup (F)	1:06.60	3	5
O	5	Senior Champs (H)	1:03.80	4	2
P	1	Senior Champs (F)	1:01.80	1	1
* Denotes long course meets			Range	1-7	0-11

It is evident that these scores tend to have much lower scores in comparison to the other mood states within the POMS instrument.

During Athlete A's short course season, her top five performances (meets C, F, L, O, and P) reflected pre confusion scores that ranged from 1-6 and post confusion scores that ranged from 0-3. With the exception of meet "P" which had equal pre and post confusion scores at 1, the data generally showed that her pre confusion scores were a little higher than her post confusion scores with the highest difference being 3 for meet "F". Athlete A's bottom five short course performances (meets A, B, D, H, and K) reflected her pre confusion scores that ranged from 1-5 and her post confusion scores that ranged from 2-5. These scores do not show a general pattern as meets "A" and "B" reflected higher post confusion scores than pre confusion scores, meet "D" indicated equal pre and post confusion scores, and meet "H" and "K" showed higher pre confusion scores than post confusion scores.

Athlete A's 6th ranked performance (meet "E") displayed a higher post confusion score (9/20) than a pre confusion score (6/20). Looking at the context of meet "E" it does seem accurate that her confusion score increased in the post performance setting as the outcome was not what she had expected.

During Athlete A's long course season (meet G, I, J, M, and N), her pre confusion scores ranged from 3-7 out of 20 and her post confusion scores ranged from 5-11 out of 20. Her long course scores reflected the highest confusion scores across the season with a pattern of higher post confusion scores than pre confusion scores, which may reflect the importance of the meet as well as the performance outcome.

Pre/Post Fatigue. In general, as shown in table 23, Athlete A's pre performance fatigue scores ranged from 2-15 out of 20 and her post performance fatigue scores ranged from 3-18 out of 20 (See Appendix II). The general tendency would be to see higher post performance fatigue scores, as this would reflect the amount of effort and physical exertion put out in her performances as well as the type of training endured before the competition (i.e., existing training phase).

Table 23

Summary of Pre/Post Fatigue (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Fatigue (20)	Post Fatigue (20)
A	10	Keyano Cup #1	1:05.73	12	13
B	8	Goldfins (H)	1:05.09	7	3
C	4	Goldfins (F)	1:03.69	2	8
D	11	Keyano Cup #2	1:06.48	15	18
E	6	Nationals (H)	1:04.06	6	7
F	2	Nationals (F)	1:02.18	5	6
*G	5	US Open (H)	1:07.21	7	11
H	7	Keyano Cup #3	1:04.92	3	7
*I	2	Pan Pacs (H)	1:05.27	2	6
*J	1	Pan Pacs (F)	1:04.56	2	8
K	9	Westerns (H)	1:05.41	6	10
L	3	Westerns (F)	1:02.26	8	5
*M	4	Canada Cup (H)	1:07.07	8	14
*N	3	Canada Cup (F)	1:06.60	8	8
O	5	Senior Champs (H)	1:03.80	9	6
P	1	Senior Champs (F)	1:01.80	2	3
* Denotes long course meets			Range	2-15	3-18

Throughout Athlete A's top five short course performances (meets C, F, L, O, and P), her pre performance fatigue scores ranged from 2-9 and her post performance fatigue scores ranged from 3-8. Generally, Athlete A's post performance fatigue scores were higher than her pre performance fatigue scores with the exceptions of meets "L" and "O" where the opposite occurred. Also, the tendency seemed to be that her pre performance fatigue scores were low to moderate, which tended to mirror her post performance fatigue scores, which were also low to moderate.

Athlete A's bottom five performances during her short course season (meets A, B, D, H, and K) revealed that her pre performance fatigue scores ranged from 3-15 and her post performance fatigue scores ranged from 3-18. Within these results, the overall trend was for Athlete A's pre performance fatigue scores to be lower than her post performance fatigue scores with the exception of meet “B” where the opposite is true. In contrast to Athlete A’s top five performances, her levels of fatigue tended to be much higher in both the pre and post performance settings during her bottom five performances, which could be a reflection of her performance outcomes as well as a reflection of her training phase that these performances occurred within. For example, meets “A” and “B” were held at the beginning of the season where training is just beginning and volume systematically increases. Meet “D” occurred just as the taper phase began, meet “H” occurred after two consecutive weekends of high-level competition, and meet “K” occurred after a high volume training camp away from home.

Meet “E” for Athlete A showed a pre fatigue score of 6 and a post fatigue score of 7. Based on the outcome of this performance, her post fatigue score reflects the lack of effort put out in this performance as she indicated that she took for granted her ability to make an A-final (field notes, 2003). The lack of effort resulted in Athlete A qualifying for the B-final (meet “P”) and not the A-final (top eight) as hoped/expected.

The general pattern of higher post performance fatigue scores seemed to be evident during Athlete A’s long course performances (meets G, I, J, M, and N). Her pre fatigue scores ranged from 2-8 and her post fatigue scores ranged from 6-14. The only exception to the general pattern was meet “N” where both pre and post fatigue scores were equal. Again, just as in Athlete A’s top five short course performances, her post fatigue scores obviously reflected the amount of effort put out in each performance, as they are within the moderate to high levels of fatigue.

Pre/Post Depression: Table 24 illustrates that overall, Athlete A's pre performance depression scores range from 0-6 out of 28 and her post performance depression scores range from 0-21 out of 28 (See Appendix JJ).

Table 24

Summary of Pre/Post Depression (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Depression (28)	Post Depression (28)
A	10	Keyano Cup #1	1:05.73	0	8
B	8	Goldfins (H)	1:05.09	0	1
C	4	Goldfins (F)	1:03.69	0	1
D	11	Keyano Cup #2	1:06.48	2	6
E	6	Nationals (H)	1:04.06	4	12
F	2	Nationals (F)	1:02.18	6	0
*G	5	US Open (H)	1:07.21	0	21
H	7	Keyano Cup #3	1:04.92	0	0
*I	2	Pan Pacs (H)	1:05.27	3	15
*J	1	Pan Pacs (F)	1:04.56	3	17
K	9	Westerns (H)	1:05.41	4	9
L	3	Westerns (F)	1:02.26	1	0
*M	4	Canada Cup (H)	1:07.07	5	21
*N	3	Canada Cup (F)	1:06.60	4	6
O	5	Senior Champs (H)	1:03.80	5	0
P	1	Senior Champs (F)	1:01.80	0	0
* Denotes long course meets			Range	0-6	0-21

Athlete A's top five performances during her short course season (meets C, F, L, O, and P) revealed her pre performance depression scores to range from 0-6 and her post performance depression scores to range from 0-1. Interestingly enough, the lowest and highest pre performance depression scores occurred during her top five performances. Three out of her top five performances have indicated higher pre performance depression scores than post performance depression scores, which could be reflective of her satisfaction with her performances.

Athlete A's bottom five performances during her short course season (meets A, B, D, H, and K) showed that her pre performance depression scores ranged from 0-4 while her post performance depression scores ranged from 0-9. The general tendency was that her pre depression scores were lower than her post depression scores. This could be reflective of her dissatisfaction with her performance outcome.

Athlete A's 6th ranked performance (meet "E") showed a pre depression score of 4 and a post depression score of 12. Again, due to the importance of the meet and the outcome of making the B-final, clearly her disappointment is apparent and as such the dramatic increase in her post performance depression score.

During Athlete A's long course season (meets G, I, J, M, and N), her pre depression scores ranged from 0-5 and her post depression scores ranged from 6-21. These values are quite different from her short course season results, allowing for the clear distinction between short course and long course within the sport of swimming.

Pre/Post Confidence. Table 25 shows that overall, Athlete A's pre performance confidence/esteem scores ranged from 12-21 out of 24 and her post performance confidence scores ranged from 3-22 out of 24 (See Appendix KK).

Table 25

Summary of Pre/Post Confidence (POMS) across the Season

Label	Ranking	Meet	Outcome	Pre Confidence (24)	Post Confidence (24)
A	10	Keyano Cup #1	1:05.73	18	11
B	8	Goldfins (H)	1:05.09	19	18
C	4	Goldfins (F)	1:03.69	19	20
D	11	Keyano Cup #2	1:06.48	12	10
E	6	Nationals (H)	1:04.06	16	9
F	2	Nationals (F)	1:02.18	17	20
*G	5	US Open (H)	1:07.21	16	3
H	7	Keyano Cup #3	1:04.92	19	19
*I	2	Pan Pacs (H)	1:05.27	17	9
*J	1	Pan Pacs (F)	1:04.56	14	8
K	9	Westerns (H)	1:05.41	18	11
L	3	Westerns (F)	1:02.26	17	20
*M	4	Canada Cup (H)	1:07.07	12	5
*N	3	Canada Cup (F)	1:06.60	16	13
O	5	Senior Champs (H)	1:03.80	16	18
P	1	Senior Champs (F)	1:01.80	21	22
* Denotes long course meets			Range	12-21	3-22

During Athlete A's short course season, her top five performances were meets C, F, L, O, and P. The range for her pre confidence scores was 16-21 and the range for her post confidence scores was 18-22. The scores are quite consistent indicating that her pre confidence scores were lower than her post confidence scores and generally differed by a maximum of 3 points. Athlete A's bottom five performances during her short course season (meets A, B, D, H, and K) showed her pre performance confidence scores ranged from 12-19 and her post performance confidence scores ranged from 10-19. Generally, her pre confidence scores tended to be higher than her post confidence scores with the outcome of her performance clearly reflected in her post performance confidence scores.

For meet "E", Athlete A's pre performance confidence score was 16 and her post performance confidence score was 9. Based on the importance and result of this particular performance, her post confidence score reflected her displeasure within herself as well as her lack of assurance in her ability to perform.

During Athlete A's long course season (meets G, I, J, M, and N), her pre performance confidence scores ranged from 12-17 out of 24 and her post performance confidence scores ranged from 3-13 out of 24.

Post Performance

MSRS. Table 26 demonstrates that overall, Athlete A's readiness scores ranged from 35%-88% and her assessment scores ranged from 22%-76% (See Appendix LL).

Table 26

Summary of Readiness and Assessment Scores (MSRS) across the Season

Label	Ranking	Meet	Outcome	Readiness Score (%)	Assessment Score (%)
A	10	Keyano Cup #1	1:05.73	35	25
B	8	Goldfins (H)	1:05.09	74	59
C	4	Goldfins (F)	1:03.69	82	71
D	11	Keyano Cup #2	1:06.48	36	32
E	6	Nationals (H)	1:04.06	36	31
F	2	Nationals (F)	1:02.18	86	73
*G	5	US Open (H)	1:07.21	65	22
H	7	Keyano Cup #3	1:04.92	78	76
*I	2	Pan Pacs (H)	1:05.27	68	41
*J	1	Pan Pacs (F)	1:04.56	75	32
K	9	Westerns (H)	1:05.41	66	34
L	3	Westerns (F)	1:02.26	79	69
*M	4	Canada Cup (H)	1:07.07	47	31
*N	3	Canada Cup (F)	1:06.60	69	49
O	5	Senior Champs (H)	1:03.80	60	61
P	1	Senior Champs (F)	1:01.80	88	66
* Denotes long course meets			Range	35-88	22-76

Athlete A's tendency was to have higher readiness scores than assessment scores across the meets with the exception of meet "O".

The largest differences between Athlete A's readiness and assessment scores was during her long course season (meets G, I, J, M, and N). The range was 16-43 percentage points with the higher differences occurring during heat swims at international competitions.

In addition to completing the MSRS, Athlete A as well as her coach were required to rate each performance on a scale of 0-10 (0 = poor performance and 10 = excellent performance) (Hogg, 2002) as shown below in table 27.

Table 27

Summary of Coach and Athlete A's Post Performance Ratings across the Season

Label	Ranking	Meet		Physical	Technical	Tactical	Mental	Overall
A	10	Keyano Cup #1	Coach	-	-	-	-	6
			Athlete A	-	-	-	-	6
B	8	Goldfins (H)	Coach	-	-	-	-	6
			Athlete A	-	-	-	-	6.5
C	4	Goldfins (F)	Coach	-	-	-	-	8.5
			Athlete A	-	-	-	-	8
D	11	Keyano Cup #2	Coach	8	8	6.5	5	6.9
			Athlete A	5.5	6.5	7	6	6.3
E	6	Nationals (H)	Coach	9	8.5	7	4.5	7.3
			Athlete A	4	4	4	3	3.8
F	2	Nationals (F)	Coach	9	8.5	9	9	8.9
			Athlete A	8	8.5	9	9	8.6
*G	5	US Open (H)	Coach	9	8.5	4	2	5.9
			Athlete A	3	3	3	5	3.5
H	7	Keyano Cup #3	Coach	9	9	8.5	8.5	8.8
			Athlete A	8	6	8	9	7.8
*I	2	Pan Pacs (H)	Coach		Coach did not go to Australia			
			Athlete A	6	7.5	5	6	6.1
*J	1	Pan Pacs (F)	Coach		Coach did not go to Australia			
			Athlete A	7	7.5	7	7	7.1
K	9	Westerns (H)	Coach	8	8	6	7	7.3
			Athlete A	5	5	5	7	5.5
L	3	Westerns (F)	Coach	9	9	9	9	9
			Athlete A	7.5	8	8.5	9.5	8.4
*M	4	Canada Cup (H)	Coach	9	9	6.5	2.5	6.8
			Athlete A	5	6	6	5	5.5
*N	3	Canada Cup (F)	Coach	9	9	7.5	6	7.9
			Athlete A	6	5	6	6.5	5.9
O	5	Senior Champs (H)	Coach	8	7	6	8	7.3
			Athlete A	7	6	7	6	6.5
P	1	Senior Champs (F)	Coach	9	9	9	8	8.8
			Athlete A	8.5	7.5	8.5	9.5	8.5

* Denotes long course meets

Each performance rating was divided in to the four components of performance which are: the technical, tactical, physical, and mental. An average score across the four components was calculated to attain an overall assessment of the performance. With the exception of meet "A" where both Athlete A and her coach's ratings were equal and meet

"B" where Athlete A's rating was higher than her coach's rating, all the other swim meets reflected Athlete A having a lower overall performance rating than her coach.

Qualitative Analysis

The analysis of data was done using the procedure created by MayKut and Morehouse (1994). Transcription of the audiotape was done verbatim, the data set was read over many times for familiarity, and individual meaning units were extracted from the transcript. The meaning units that were similar were grouped together and a single phrase that captured the essence of the units in the category was created. These phrases became the themes in which the data is presented. The meaning units under each theme were compared to verify that each meaning unit was categorized under the proper theme. This was done using the constant comparative method (Glaser & Strauss, 1976; Lincoln & Guba, 1985).

The data analysis identified 10 main themes summarizing Athlete A's reflections of her performance states over the 6 month data collection period. These themes include: the monitoring process, anxiety, confidence, concentration, motivation, recovery, preparation, performance, technique (physical), and future plans.

Athlete A found the actual monitoring process both a positive and negative experience. The latter really stemmed from the process being long, repetitive, and difficult to do on her own, "Well, just repetitive basically, they were just always the same thing over and over" (Athlete A, 2003). The former initiated an in depth look into her thoughts and feelings in the pre and post performance setting, "...I think it helped me realize how I was feeling mentally, I was able to like understand whether I was certain or uncertain or how prepared I was basically" (Athlete A, 2003). In addition, it also allowed her to increase her awareness of her psychological states prior to racing.

Athlete A commented on both her cognitive and somatic anxiety states as being factors affecting her performances. Her perception of cognitive anxiety, under the guise of negative thoughts and self-doubt were a hindrance to her performances whereas, somatic anxiety in the forms of feelings of queasiness ("butterflies") and increased heart rate were perceived as facilitative to her performances. Athlete A also indicated a positive relationship between somatic anxiety and confidence, "it shows that I'm ready, and I can do it", as well as, somatic anxiety and drive, "it's a good thing because it brings out the drive sort of thing".

In the area of confidence, Athlete A noted specific boosters and downers of her confidence states in relation to her levels of drive and preparation. Apparently, throughout her season, Athlete A did not identify any confidence boosters but now finds that when there is little or no competition, absence of pressure, and zero mental blocks, her confidence increases. On the other hand, the primary reason for Athlete A possessing low confidence levels was due to "not hitting the goals I basically wanted to hit".

Another psychological theme identified in the interview was the construct of concentration. In her reflections, Athlete A found her concentration and focus being affected by: specific training sets (e.g., high volume and boring sets), and specific race detail, "…when I am sometimes in a race and something goes wrong like the turn, right, or just something like that, then I just start to think about that specific detail and I don't really concentrate on the rest of the race…" (Athlete A, 2003); and social/environmental factors (e.g., teammate's problems or catching up on school work), "…but also at Canada

Cup, I was thinking about other people's problems more than my own swimming, so that was a distraction" (Athlete A, 2003).

In terms of Athlete A's motivation levels, she could summarize them in two words, "go fast". She repeatedly used those words which meant that she always knew that she could go faster than her actual times, "I know that there is so much more in me, I know that I can swim so much faster, and I just want to be able to finally get it all out and have this amazing swim". Athlete A's motivation was also both intrinsic and extrinsic in nature. Intrinsically she was driven by select emotions (e.g., anger) and possessed a strong belief in herself (e.g., self-assurance). Extrinsically she was driven by friends of equal or better ability and monetary rewards.

The theme of recovery reflects Athlete A's ability to physically and mentally relax prior to a major competition, "I love recovery, I feel like I'm just more relaxed and I swim fast when I am recovered" (Athlete A, 2003). Athlete A deemed eating, sleeping, and hanging out with friends outside the swimming environment important for optimum recovery, "…just hanging out with people I don't see at the pool all the time, and just get a different atmosphere totally, just not really thinking about swimming".

The themes of preparation, performance, and technique are interrelated as both preparation and technique had effects on Athlete A's overall performance process and outcome. Athlete A competed in two extremely critical competitions which provided her with valuable experience as well as knowledge in regards to her own personal preparations, "…both in my physical preparation and my mental preparation, it was kind of just like wow, it opened my eyes you know and it showed me what I was doing wrong and what I was doing right". Specific to physical preparation, another theme of technique emerged. Athlete A differentiated between "fast swimming" and "slow swimming" with the technical aspect of her performances. Improving starts, turns, and finishes were critical steps necessary to help Athlete A improve on her times.

The theme of performance encompassed a variety of factors. Overall, Athlete A perceived her season to be inconsistent with the types of competitions (e.g., club meets versus international meets), timing of races (e.g., morning heat races versus night final races), importance of competitions, and goal attainment as reasons for her inconsistencies. Common perceptions and behaviors for Athlete A were: (1) night swims are more important than morning swims, "I don't usually feel ready in the morning…it also has to do with the atmosphere right, cause at night it's like okay I'm ready, everyone is watching and I have to swim fast…", (2) 200m backstroke is scarier than 100m backstroke, "… I'm not scared, well I do get scared to some extent…I have such a mental strain, I don't know, I don't know what it is, and I want to get rid of it…", (3) club meets are not as important, "I don't really care about club meets, it's almost a joke for me, how can you not treat it differently, I mean at an international meet you are like surrounded by all these fast people and you feel like you have to go fast to show them who you are you know. And at the club meet it's just like you don't really care", (4) not reaching set goals is frustrating, and (5) taking performances for granted, "…I almost thought for sure I would make the final, and I took that for granted, which sometimes I tend to do, which is very bad".

The last theme that emerged from the data was the future. Athlete A views her future in swimming as heading in a positive direction; specifically moving to higher levels of competition, "…want to make the Pan Am team…I know I'm ready and I know

I can go in there and just swim so fast and make this team" (Athlete A, 2003). By using the knowledge and tools provided from this study both physiologically as well as mentally/emotionally, Athlete A feels she can be ready to achieve consistent performances.

CHAPTER 5

Discussion

The current research addressed four different purposes. The first purpose was to extend the application of the IZOF model and anxiety by monitoring various other psychological constructs (i.e., anxiety, confidence, concentration, motivation, mood states, and recovery-stress) across a season. This was achieved by using various trait (SAS, CASS, SMS, CSCI, RESTQ-Sport) and state (CSAI-2, MRF, POMS, MSRS, AGI) instruments as well as a post season interview. Furthermore, descriptions of these constructs were made using Hanin's psychobiosocial state dimensions of form, intensity, content, context, and time.

The second purpose was to develop and use a pre performance athlete-generated instrument (AGI) in addition to the existing psychometric instruments to create a unique and individualized profile. The AGI measured the four major performance factors (anxiety, confidence, concentration, and motivation) using four, ten-centimeter bipolar lines on which Athlete A indicated the intensity of her psychological state at that particular time. According to Athlete A, the AGI was appealing to her because she understood the words she had chosen since they had personal meaning and she could relate them to her own experiences. On the other hand, there were words on the other questionnaires that she did not understand the meaning of and as a result had to ask the investigator a number of times to clarify the meaning. This would have important consequences such as potentially inaccurate data due to the lack of understanding and comprehension of words.

The third purpose was to become aware of the mental/emotional experiences of Athlete A through profiling and monitoring her throughout her competitive season using both qualitative and quantitative methods. It was beneficial to conduct a post season interview as well as to engage in informal conversations with Athlete A as further support to the questionnaire data collected. At times it was difficult to fully understand the levels/intensities of a particular psychological construct. Clarity of these values emerged after understanding the context in which the data was collected (e.g., type of competition, timing within the season, social elements). In creating a psychological profile and taking the time to discuss the personal reflections of Athlete A and her performances, a better understanding and a complete picture could be described. The advantage of this is primarily in creating a psychological skills training program targeting Athlete A's weaknesses while at the same time encouraging her to continually maximize her strengths (Butler, 1997). Also, profiling Athlete A encourages a further understanding of the athlete from a coach and sport psychologist perspective and more importantly promotes her own self-understanding (Butler & Hardy, 1992).

The fourth and last purpose was to identify patterns in the mental/emotional component of Athlete A's performances through repeated measures and observations. This of course was achieved by following Athlete A for a six-month period (September 2002-March 2003). Constructing this profile was interesting in the sense that it depicted Athlete A's performances visually/pictorially. Furthermore, showing Athlete A her profile has powerful implications from an applied sport psychology perspective because it is in some ways giving the athlete the "truth". It is making the athlete become responsible and accountable for her performances and at the same time shedding light on areas that are dominant as well as those that must be improved upon (Butler, 1997). In other words, the athlete does not have the option of making excuses for poor performances when they are documented and presented to them.

In regards to the trait questionnaires, Athlete A demonstrated consistent results across all measures for both data points with the exception of the CASS questionnaire. Between the first and second measurement, the largest discrepancy occurred in the concern category. Specifically, factors 1 (ego threat), 3 (skill level), 4 (perceived importance), 5 (social debilitation), 7 (real-life stressors), 8 (on-going performance), and 9 (personal expectations) all decreased in concern from the beginning of the season to the end.

According to Athlete A during her post season interview, her concerns in each of these factors decreased as the season went on because her "focus tended to narrow from parents, support systems, and uncertainty of performance, to more race specific concerns" (Athlete A, 2003). Further, the more focused in this one area she became, the less concerned she was about the other factors because they lacked importance that her race/performance gained as the season progressed.

According to the normative data provided by Marchant et al. (1997) for the frequency scale of the CASS questionnaire, Athlete A is above the norm for factors 1 (ego threat), 2 (perceived readiness), 3 (skill level), 4 (perceived importance), 7 (real-life stressors), and 8 (on-going performance). Athlete A is below the norm for factor 5 (social debilitation) and consistent with the norms for factors 6 (parental expectations), 9 (personal expectations), and 10 (perceived uncertainty). In other words, Athlete A has the tendency to worry more about factors affecting her swimming compared to other female athletes who have also completed the CASS questionnaire. Specifically, she worries more about her competencies and capabilities as a swimmer, how ready she feels before a competition, her technique, the importance of the competition, stressors outside of swimming, and whether or not she is improving in her sport. The factors she worries about support the cognitive anxiety data from her interview where she describes her self-doubts (e.g., training, school, etc.) and their effects on her performance.

In addition, the results from the SMS indicated that although Athlete A is neither more extrinsically nor intrinsically motivated, she does show a non significant increase in intrinsic motivation closer to the end of the season. Perhaps this indicates her desire to make a national team since the opportunity did exist later on in the season, "...this summer's trials, because I really, really, really, really, really, really want to make the Pan Am team and I just basically have my heart set on it...I know I'm ready and I know I can go in there and just swim so fast and make this team" (Athlete A, 2003).

For Athlete A, anxiety, concentration, confidence, and motivation within the competitive swimming environment are fairly constant dispositions that can be measured over time with accuracy (Manzo et al., 2001; Pelletier, et al., 1995; Smith et al., 1990).

The RESTQ questionnaire was given to Athlete A four times throughout the data collection period. Low to moderate levels of general stress and fluctuating levels of general recovery were found after the first measure. In addition, moderate levels of sport-specific stress and recovery were also documented. One week prior to a major competition, it is important for Athlete A to mentally/emotionally and physically recover from high volume training in order to optimally prepare to compete at a high level competition. The data indicate that Athlete A experienced somatic stress in the forms of soreness, physical complaints, fatigue, and exhaustion one week prior to that particular competition. Furthermore, during that national competition, Athlete A did complain about not feeling ready to compete, a lack of good training, and fatigue (Field notes, 2003). Ideally, for optimal performance, sufficient time and adequate resources are necessary for recovery to balance increased stress levels (Kellmann & Kallus, 2001).

The second measure taken after a long training camp (two weeks) and a major international competition indicated a drop in the general recovery area which is contrary to a healthy, positive trend necessary for complete recovery from any type of stress. Athlete A's sport-specific stress levels decreased slightly which is a good indicator of positive recovery. Unfortunately, the sport-specific recovery category reflected a decrease in recovery levels which may possibly be a sign of Athlete A's difficulty in effectively coping with sport-specific stress.

The third measure taken during a high volume training camp in Hawaii displayed a positive trend with general stress decreasing, general recovery increasing, sport-specific stress increasing, and sport-specific recovery increasing. The demands of a high volume training camp are quite intense and require the athlete to train up to three times a day. Consequently, a training camp of this magnitude is held away from home to minimize distractions (e.g., school, family, friends, daily hassles). Athlete A's data acknowledge that she is capable of handling the demands of a training camp.

The fourth measure taken after two major competitions indicated a general and sport-specific pattern that was contrary to a healthy recovery pattern and should be a concern for both Athlete A and her coach, in terms of coping with stress in Athlete A's general life as well as her competitive swimming life. Specifically, Athlete A's general life showed an increase in scores for conflicts, pressure, and social stress, whereas, in her sport-specific area, her scores for burnout/emotional exhaustion increased dramatically. The context in which this measure was taken was quite emotional for Athlete A. At this particular time, Athlete A was dealing with teammates leaving, catching up with schoolwork, and coping with issues regarding her significant other. As Athlete A claimed at the end of meet "N", "I just want to throw my head away!". She also went on to say, "…we came home and all these people all of a sudden said they were leaving…and then I had all this stuff at school I had to work out…it just seemed like there were all these problems" (Athlete A, 2003).

When comparing these general life scores to those taken from the second measure of the CASS (factor 7 - real-life stressors), some discrepancies can be found. Specifically, the CASS scores were low whereas the RESTQ scores were higher. The RESTQ was given one week after the last swim meet which turned out to be when Athlete A was dealing with a lot of emotional baggage. The CASS questionnaire was given approximately a week and a half after the RESTQ was given in which Athlete A had dealt with most of the issues. She had enough time to catch up on homework, deal with her significant other, and come to terms with some of her teammates/friends leaving. Consequently, after taking the CASS questionnaire, concerns she would have had mostly dissipated by that time.

In summary, with the exception of the third measure, Athlete A seemed to have a difficult time recovering from stress not only in the sport-specific setting, but also in other areas of her life. The pattern seemed to get worse; as her stress increased, her ability to cope and recover from this stress decreased.

The findings for the rest of the data are quite interesting as there is no distinct pattern in the results and no definite relationships which can be validated. Although a disappointing finding, it would be naive on the part of the researcher to expect to see ideal patterns and relationships emerge from the data collected. The lack of picture perfect results could be attributed to many external factors affecting this athlete which unfolded throughout this competitive period and may have strongly influenced the outcomes of her performances. For example, type of meet, perception of success, team/friendship dynamics, or simply being physically tired at that particular time during the cycle (Field notes, 2003). Inconsistent results in terms of outcome as well as scores within the data were found.

Anxiety

In terms of data collection, all state instruments were administered on average one hour prior to and one hour post performance (time dimension) and only during competitive swim meets (context dimension) where Athlete A participated in her main event. In interpreting the anxiety data, Athlete A found that cognitive anxiety, mainly in the form of self doubt, for example, feeling apprehensive and unsure (Field notes, 2003), "...well, if it's in my mind, like if it is mentally, it is bad, because I know, like I mean doubts, it's always bad, there is not a way to get around that" (Athlete A, 2003), was debilitating to her performances (Burton, 1988). Although her long course season performances were not her desired performances, cognitive anxiety levels tended to be higher prior to her top two performances out of the five she swam in. These performances occurred at her first international swim meet where she represented her country for the first time in her swimming career. On the other hand, during her short course season, Athlete A's cognitive anxiety prior to racing tended to be low to moderate which was conducive for more successful performances. According to Athlete A, the word certainty/uncertainty tended to relate most to her states of cognitive anxiety. Athlete A associated certainty/uncertainty with her confidence levels and found that prior to racing, she engaged in thinking about negative things. "...I feel totally confident in myself but sometimes I just have uncertainties, I look back on my training and I don't look at the good stuff, I look at all the bad stuff...like slacking off and missing workouts – or not training as hard as I should have" (Athlete A, 2003). In other words, being "certain" meant decreasing the negative self-dialogue she usually engaged in prior to racing. In this instance, her anxiety prior to racing seems to be more cognitive than somatic and she tends to find a positive relationship between her feelings of certainty and performance. No relationship was found for the AGI questionnaire for Athlete A's long course season, but she did display a positive relationship between her levels of certainty and performance outcome for her short course season.

Athlete A's experience of somatic feelings (butterflies or increased heart rate) (Field notes, 2003) was perceived as facilitative to performance, "...it's a good feeling, it shows that I'm ready, and that I can do it" (Athlete A, 2003). Jones et al. (1994) and Jones and Hanton (1996) have supported the idea of somatic anxiety as facilitative to performance for swimmers perceiving positive expectations. In addition, Hanton and Jones (1999a) found that male swimmers viewed their anxiety symptoms as facilitative the more mature and experienced they became. Perhaps this is the case for female swimmers as well. Across the season for both short and long course meets, low to moderate levels of somatic anxiety approximately one hour prior to performance seemed to produce successful performances for Athlete A.

Although the intensities of both cognitive and somatic anxiety necessary for optimal performances are inconsistent, the interpretation of Athlete A's anxiety is quite definitive as she deems cognitive anxiety as debilitative and somatic anxiety as facilitative to performance. "…if I feel physically, like if I have butterflies, or if my heart starts pounding, it's a good thing because it brings out the drive sort of thing, and I usually have some sort of butterflies…so it's a good thing, it shows that I'm ready and that I can do it" (Athlete A, 2003).

Confidence

Athlete A's confidence indicated no clear cut patterns or relationships to emerge from the data collected. Higher levels of confidence appeared prior to best time performances during her short course season (Burton, 1988), during final swims in her long course season, and also at meets Athlete A deemed as important. These performances allowed for Athlete A to increase her confidence by demonstrating to others her swimming ability (e.g., coach, other swimmers, other coaches) and the environment favored Athlete A to perform successfully (i.e., good competition, Athlete A being favored to win) (Vealey et al., 1998). For the CSAI-2 and MRF scales, the data shows a tendency for Athlete A to possess higher levels of confidence prior to competing in order to increase the probability of a successful performance. According to Athlete A's personal instrument, confidence was described as a feeling of pride, "…it's a feeling when you finish first or when you win, or when you have a really good performance and let's say, the coach is really proud of you and your teammates are really proud of you, and you accomplish something so big and I just feel really proud to be a swimmer and to have spent all this time training for that one moment…" (Athlete A, 2003). Her sense of pride emerges prior to a race when she experiences a moment that acknowledges how she has come to that point and that regardless of the anticipated outcome; she is good for just making it that far. "…I was just standing there before my race, I was like, you know what, regardless of the outcome of this race, I have made it this far and I am good for standing here at this final of the National competition and I just felt really proud" (Athlete A, 2003). In other words, she feels no real relationship between her sense of pride and performance outcome prior to her swim, but feels that there is a positive relationship in the post performance setting. For example, after a heat swim she realizes that she has made a final, "…when I made the final in the 50 meters and I was in lane eight and I was – okay I'm in lane eight, I'm swimming next to the Canadian record holder, and I felt so happy just to be there, and everyone was cheering and I was on television…some people will never get this feeling" (Athlete A, 2003). Also, when she has achieved something significant after a final swim, "…if after the race I accomplished something really big, I would be like, well I'm proud of myself for being able to accomplish this at such a small competition…if I can do it here, I can do even better at a bigger competition" (Athlete A, 2003).

Therefore, in keeping with the data, higher levels of confidence or a sense of pride emerged at meets where without a doubt she knew she could perform successfully, as well as, at meets she perceived as important to her overall swimming career (e.g., international swimming events).

Concentration

The psychological construct of concentration according to Athlete A was described as a feeling of being focused and ready prior to competing, for example, focusing on the race, not worrying about other competitors, and focusing on having a good time outcome (Field notes, 2003). "…because when I am focused, I do the opposite and I think of all the good things I have done. So I think of all the times that I have done really good workouts and I think of all the good accomplishments that I have had up to this point and I kind of look back on them and say to myself, if I did it then, then I can do it again now only faster and better" (Athlete A, 2003). Athlete A also described a positive relationship between her feelings of being focused and ready, and the outcome of her performance, "…I'm just ready, I'm ready for the race, I'm ready to take on the challenge, I'm ready to fight…" (Athlete A, 2003).

The data collected reflected some inconsistencies but overall indicated a positive relationship between her pre performance concentration/focus/readiness and performance outcome as evident in her top five short course meets (C, F, L, O, P) as well as in meets "J" and "N". This relationship however, is dependent on the circumstances surrounding the performance. For example, during races, Athlete A's focus may waiver as a result of a bad turn which causes her to overanalyze her mistake and stray away from being in the here and now, or simply thinking about "other people's problems more than [her own] swimming" (Athlete A, 2003). For example, surrounding meets "M" and "N", Athlete A dealt with issues around teammates leaving the following season, distractions of school, and problems with her significant other. Furthermore, these instances where she loses focus has a direct impact on her performance outcome, "…the race is usually lost, it's hard to get it back… sometimes it's because I had a bad turn so I have to go even faster to make up for that turn, so basically it just depends on the situation" (Athlete A, 2003).

Motivation

Athlete A's sense of motivation was described as a driving force she felt prior to competing in a race. "…I have this drive inside of me and I want to win and I want to touch the wall and see my name first. And I want everyone to be happy and cheer for me and I want the announcer – I just have this inside me, I just want to win" (Athlete A, 2003). Athlete A admits that her drive does not always exist, "Well, Nationals of course… um all the other smaller meets, I mean they are not really, I don't really have that drive and that motivation to win" (Athlete A, 2003). Specifically, her drive is strong at very competitive, higher level meets and minimal at smaller meets where she is quite apathetic whether she wins or loses. Triggering this driving force comes from wanting to pursue excellence, winning and rewards (Watson et al., 1984, 1985), and having clearly defined goals that must be challenging and that have a highly desired outcome (e.g., making a national team). "…I have just been thinking about making Pan Ams and I think that has been a really big motivation for me… I have to train hard, I have to do all this stuff, you know, flexibility, dryland, running, stretching because I know I am going to have to swim a lot faster that I have been to make Pan Ams…" (Athlete A, 2003). Therefore, this driving force is seemingly both internal and external in nature. During the course of the season, Athlete A's motivation levels were inconsistent and varied according to the type of meet she competed in. Her degree of drive can hit high levels indicating a strong desire to win and ultimately positively affecting her performance, but can also occur at lower levels indicating that she does not regard the meet as all that important. Perception of the type and importance of meet is a critical factor for Athlete A's motivation/drive levels prior to performance.

Mood States

Depending on the specific circumstances surrounding a particular swim meet (e.g., school pressure, high volume training, social factors, etc.), Athlete A's mood states tended to fluctuate dramatically across the season. The general pattern in the pre performance setting was to have higher levels of vigor and confidence and low levels of confusion, depression, anger, fatigue, and tension. At times, Athlete A displayed moderate levels of tension and fatigue scores supporting Raglin et al.'s (1991) data that female swimmers tend to score themselves higher on the tension component compared to other mood states. These levels may reflect external factors that may have contributed to Athlete A's overall mood state. In the post performance setting, fluctuations in her mood states were apparent again with the most critical factor affecting the results being the outcome of her performance. Generally, Athlete A's post vigor scores remained stable, post confidence fluctuated depending on outcome as did her post tension, anger, confusion, fatigue, and depression scores.

The significance of the pre POMS scores are to identify Athlete A's states of readiness whereas, the post POMS scores are responses to a race just completed (e.g., a heat swim) and have great importance if another race is to follow (e.g., a final swim). Ultimately, if this is the case, the emotional residue from the previous swim/race should be dissipated by the next race. For example, meet "E" and "F" were short course national competition races. Meet "E" was a heat swim where her performance outcome was not satisfactory. Prior to this specific race, Athlete A felt "apprehensive and unsure, not too excited to swim, and lacked belief in her abilities". After the race, she admitted to taking the race for granted and not feeling completely ready to compete. She did go on to explain that she would be able to get past this race and look forward to the upcoming final that night (Field notes, 2003). Prior to meet "F" which was the B-final of the same national competition, Athlete A's mind set was very positive and she felt quite determined to do well, "I'm pumped to swim this race, I'm excited and feel ready to go" (Athlete A, 2003). The outcome of this race was that she came first and achieved a best time. Athlete A's performance outcomes typically show slower times for heat swims and faster times for final swims which reflect her ability to control her moods from heats to finals, therefore, her scores on the pre and post POMS lead us to believe that she does have the ability to manage her moods so that they will not affect her subsequent performance(s) (e.g., final swims).

Post Performance

In the post performance setting, based on the MSRS data as well as the athlete and coach ratings, Athlete A tended to be quite critical in her evaluation of not only her performance preparations and overall performance (i.e., physical, tactical, technical, and mental), but also her performance outcome. Hogg (1999) supports this data of swimmers being overly critical in their evaluation of their overall performance when using the MSRS as their satisfaction scores tended to be lower than their readiness scores.

In particular with Athlete A, I found that in the post performance setting when she achieved a successful performance, her demeanor was positive, happy, and excited. Her behaviors of cheering for her team, becoming hyper, hanging out with friends, and visiting other swimmers from different swim clubs (Field notes, 2003), were very evident after a successful performance. However, when an unsatisfactory performance occurred, Athlete A's disposition was quite the opposite. She would become very quiet, stay away from her team, avoid speaking to anyone, sulk, and become very angry if anyone approached her (Field notes, 2003). When evaluating her performance in the areas of physical, technical, tactical, and mental, it was quite apparent from her body language (e.g., sitting further away from me, head was always down, spent a long time thinking), that she was not willing to give herself credit for her successes as they were never good enough. On the other hand, when her coach was assessing her performances, he had no problem giving credit where it was due and criticizing each area when it was warranted.

Summary

Across the season, Athlete A competed in 11 short course swims and five long course swims (heats and finals). Based on the data collected, there seems to be a clear distinction between Athlete A's perceptions of her short course and long course competitions which is evident in the differences found among the constructs studied. Athlete A's short course season comprised of a variety of meets ranging from small to large, less important to very important, and a low degree of difficulty to a high degree of difficulty. All of these factors may have contributed to her performance outcomes. On the other hand, Athlete A's long course season comprised of very important, difficult, and highly competitive national and international competitions. Her results during the long course portion of her season could also be as a result of these factors.

Based on the analysis and discussion, it is apparent that the type and importance of meet, as well as, a variety of social and environmental factors contribute to the overall performance of Athlete A.

CHAPTER 6

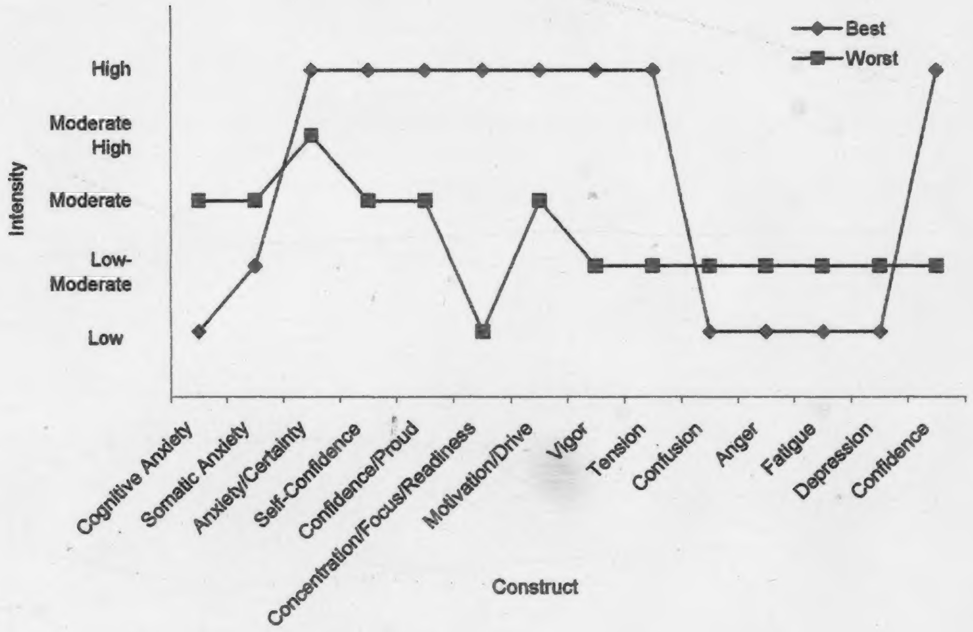
Recommendations and Future Directions

A profile of Athlete A's short course season (N=11) was used to create her individualized performance profile because she achieved two best time performances. Athlete A's long course season on the other hand was not as successful. Within the sport of swimming, long course competitions are much more critical in that higher level competitions (e.g., Pan American Games, Commonwealth Games, and Olympic Games) are all long course competitions (i.e., races are swum in a 50m pool rather than in a 25 m pool). Therefore, it is important for Athlete A to continually improve her long course times in order to increase her chances of making the national team standard. Throughout the season (September 2002 – March 2003), Athlete A competed in five long course opportunities; each significant in terms of their importance. Although Athlete A did not perform poorly, she did not achieve any best time performances.

Profile

Figure 1 displays Athlete A's performance profile comparing the average of her top five short course performances to the average of her worst five short course performances.

Figure 1. Best vs Worst Short Course Performance Profile for Athlete A



Overall, for Athlete A to achieve a best performance, she must possess low levels of pre performance cognitive anxiety, low to moderately-high levels of pre performance somatic anxiety, moderate to high levels of confidence, as well as, high levels of motivation/drive, confidence/pride, anxiety/certainty, and concentration/focus. In addition, high levels of pre performance vigor and confidence, and low levels of tension, confusion, anger, fatigue, and depression, will help to achieve a top level performance. On the other hand, low to moderate levels of pre performance cognitive and somatic anxiety, moderate levels of confidence and confidence/pride, moderate to high levels of motivation/drive and anxiety/certainty, low to moderately-high levels of concentration/focus, and low to moderate levels of vigor, tension, anger, confusion, fatigue, depression, and confidence will likely result in a poor performance for Athlete A.

Recommendations for Athlete A

First, slower performances occurred during heat swims rather than final swims. Although this is physiologically strategic, mentally importance was not placed on heat swims. As a result, by failing to make the A-final Athlete A missed out on significant opportunities to challenge herself against the top 8 swimmers and make the podium. By taking heat swims for granted, she had to settle for competing in B-final swims (swimmers ranked 9-16). Therefore, Athlete A should use a strategy (e.g., corrective experiences) to now make it a priority to perform sufficiently well in order to qualify for the A-final.

Second, levels of somatic anxiety tend to be a helpful indicator of a successful performance as Athlete A needs to feel excited mentally and physically prior to performing. This tendency is negated when cognitive anxiety overrides somatic anxiety. In this instance, self-doubt and lack of belief in her training weigh heavily on Athlete A's mind which ultimately affects her performance outcome. Fortifying unshakeable self-belief and resilience are key ingredients of mental toughness (Jones, Hanton, & Connaughton, 2002). As a result of building a strong foundation of mental toughness prior to any performance, belief in self and her training program may perhaps result in consistent performances, specifically, from heats to finals. Self-statement modification or positive self-talk, emotive imagery, and cognitive reframing may help her produce the appropriate somatic responses.

Third, it is vital for Athlete A to engage in a debriefing protocol after each performance to eliminate any mental/emotional residue prior to any subsequent performances. Athlete A's emotional tendencies in the post performance setting, unless driven by anger, seemed to eat away and diminish the likelihood for performance success. By constructively asking and answering the right questions of her performance (Socratic dialogue) and creating a plan for the next performance, consistent performances may be achieved. The place of self-analysis and a didactic approach to debriefing her performance would be most beneficial in increasing awareness of her performance limitations.

Fourth, my observations of Athlete A lead me to believe that she thinks too far ahead. By focusing only on the end result (e.g., time outcome or making a team) she loses her sense of the process. Each performance is a stepping stone to her ultimate goal – by consistently preparing and caring about each performance (e.g., eliminate distractions, focus on positives) her goals and dreams may start to appear closer. It is very important for this athlete to channel her attention towards task execution and completion.

Fifth, emotions tended to be a critical factor for Athlete A. Anger, confidence/pride, motivation/drive were desired emotions for successful performances. On the other hand, tension, uncertainty, and fatigue played prominent roles in unsuccessful performances. Athlete A's willingness to learn how to focus in the here-and-now, minimize external distractions, and cope with fluctuating training, environmental, and social factors would be necessary to safeguard performances. Putting optimum emotions in place will ensure effective performance outcomes. Any dysfunctional emotions will trigger ineffective coping responses.

Sixth, confidence is a critical psychological factor that affects performance. It is evident that Athlete A requires high levels of confidence to perform well and acquires this confidence from situations where she is favored to win, where there is "no pressure or mental blocks", and where there is a possible reward (e.g., money or recognition). Ultimately, Athlete A needs to persist in building her confidence levels so that they remain consistent regardless of the circumstances. In order to do this, it is important that she let go of previously poor performances through meaningful debriefing, prepares herself well physically and mentally, focuses on positive performances, celebrates successes, and sets realistic and achievable goals, or in other words, engage in the right behaviors.

Recommendations for Coach

First, to engage in productive and meaningful debriefing sessions with Athlete A. Tease out critical details (i.e., strengths and weaknesses associated with the performance) of each performance in order to make subsequent performances solid and strong in every aspect (technical, physical, tactical, mental/emotional).

Second, as life experiences inflict distractions on Athlete A's swimming performances, it is important to monitor these distractions and their impact, and help Athlete A focus with the best attentional dimension both in training and competition (Nideffer, 1993). In other words, help to create separation so that these external distractions do not come to the forefront at critical moments of a competition (e.g., just before a race).

Third, many doubts that Athlete A experienced were associated with training and therefore, throughout the training process, it is important to have regular one-on-one meetings with Athlete A specific to training process and performance in order to increase her belief that her specific training plan is working. By including her in the process and allowing her to contribute ideas and opinions, she may feel much more confident and accountable and consequently this may eliminate any apathy.

Implications

Firstly, the IZOF model suggests that athletes have an individual zone in which their optimal performance is likely to occur. Utilizing psychometric measures on multiple occasions opens doors to determine patterns and trends for a mental/emotional-performance relationship across the season. In addition to suggesting a "zone" and creating a profile, understanding the athlete's mental/emotional states prior to, during, and post performance is valuable across time for long term success.

Secondly, suggesting that each athlete is unique and individual (Hanin, 1995) can be validated through in-depth interviews and regularly scheduled two-way dialogue. Coaches are in a position where engaging in conversations and observing behaviors to acquire detailed insights into the thoughts and actions of their athletes is easily accessible on a daily basis. The opportunity exists for coaches and consultants alike to learn significant details about what makes each athlete "tick" in both training and competitive environments.

Thirdly, mental training consultants are obligated to look into individual differences and create programs specific to the psychological tendencies and needs of each athlete. As well, the benefits of athletes reflecting on their past performances and seasons is an essential and vital learning tool for both the coach and athlete in order to create an environment where evaluation and refinement is viable, and to facilitate the athlete to the next level of performance. In addition, there are several cognitive-behavioral strategies that might be used effectively by both coach and athlete that need to be made specific to meet the demands of the competitive swimming environment (Mace, 1990).

Fourthly, by using existing instrumentation and creating a specific athlete-generated questionnaire or checklist, identifying which type of instrument lends itself to creating a more valuable and precise profile of the athlete could be quite informative.

Fifthly, the advantage to monitoring and eventually profiling an athlete across a season using repeated measures rests in the athletes' and coaches' ability to create and design a very individualized psychological skills training program (PSTP). According to Hogg's performance model (2000), planning for peak performance entails: understanding, teaching, integrating, monitoring, evaluating, and refining. The current research attempted to explore the possibility of monitoring and profiling performance across a season and by doing so, open the door to accurate performance assessment and subsequent refinement.

Strength and Weaknesses

Like all investigative research, the study has both strengths and limitations. Firstly, the study uses multiple and repeated measures acquired over a specific time period (September 2002-February 2003) versus a single measure that obviously has limited interpretative powers related to performance outcome. This allowed for increased external validity across all data sources (coaches and 10 self-report measures) and a larger data set to analyze and interpret. The data collected generated a comprehensive psychological profile of the subject using Hanin's IZOF theoretical framework. The data also provided insights into the psychological variables examined and whether or not the athlete views these as facilitative or debilitative in terms of her performance. It also provided new insights into how individual factors affect not only specific swim events, but also interactional effects among team members, and the relationship between the athlete's general life and competitive sport life.

Secondly, the interview process was advantageous in supporting the self-report psychometric measures. The subject was encouraged to be open, honest, and comfortable in sharing her swimming experiences and their relationship to perceived anxiety, confidence, concentration, motivation, mental recovery, and mood states.

Thirdly, since previous use of the IZOF model has been limited to the construct of anxiety, it was hoped that by applying the model to other critical constructs (i.e., confidence, concentration, motivation, recovery-stress, and select mood states) a more comprehensive profile would be created. This is more likely to help the athlete achieve and maintain optimal levels of functioning both in training and in competition.

Fourthly, the creation of an athlete-generated instrument was unique in itself and certainly creates an opportunity to explore the advantages associated with the use of individualized questionnaires in future research in the sport psychology field.

A limitation of the research was reflected in those typical disadvantages associated with self-report methods and interview techniques. There will always be social desirability concerns related to perceived demand characteristics as well as the accuracy and honesty in expression that needs to be safeguarded. Self-report measures are limited in themselves because they are simply subjective opinion of athlete's perceptions and their accuracy may be somewhat questionable, additionally, resulting data from this study could also be attributed to the non-use of swimming specific scales. Consequently, observations of the athlete in competitive situations in the past have been rather limited and the coach overly protective, but with the use of regular and repeated measures these limitations may have been reduced and ultimately eliminated.

A second limitation of the study was the use of newly developed self-report research tools. The limitation lies in the lack of reliability and validity evidence since these instruments have never been tested for these psychometric properties before.

Future Directions

Future directions recommended from this particular research are: (1) to conduct longitudinal studies across a season or seasons using less instrumentation to generate a performance profile; (2) to explore the concept of individualized athlete questionnaires to accurately identify mental/emotional states; (3) to implement general coping strategies for the athlete and test whether these target her weaknesses; (4) to expand the current research by creating a PSTP program and evaluate its effectiveness in order to validate the monitoring process; and (5) to monitor and profile athletes simultaneously in both the physiological and psychological areas in order to produce a descriptive and integrated picture of the athletes. Any of the above suggestions may be supported by a pilot study in order for the researcher to gain experience in interpreting specific and quality data generated from the monitoring process.

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Appendices

Appendix A

Sport Anxiety Scale (SAS)

Name: ______________________ **Macro:** ________ **Date:** ______________

Please respond to the following statements according to the scale below to the best of your ability. Blacken out ● the one response that best describes how you generally/typically feel, when you think about a major competition. Use scale 0 (Not at all) - 3 (Very much so).

Not at all: 0 **Somewhat: 1** **Moderately so: 2** **Very much so: 3**

		0	1	2	3
1.	I feel nervous.	○	○	○	○
2.	During competition I find myself thinking about unrelated things.	○	○	○	○
3.	I have self-doubts.	○	○	○	○
4.	My body feels tense.	○	○	○	○
5.	I am concerned that I may not do as well in competition as I could.	○	○	○	○
6.	My mind wanders during competition (while I am competing).	○	○	○	○
7.	While performing I often do not pay attention to what is going on.	○	○	○	○
8.	I feel tense in my stomach.	○	○	○	○
9.	Thoughts of doing poorly interfere with my concentration during competition.	○	○	○	○
10.	I am concerned about choking under pressure.	○	○	○	○
11.	My heart races.	○	○	○	○
12.	I feel my stomach sinking.	○	○	○	○
13.	I am concerned about performing poorly.	○	○	○	○
14.	I have lapses in concentration during competition because of nervousness.	○	○	○	○
15.	I sometime find myself trembling before (or during) a competitive event.	○	○	○	○
16.	I am worried about reaching my goal.	○	○	○	○
17.	My body feels tight.	○	○	○	○
18.	I am concerned that others will be disappointed with my performance.	○	○	○	○
19.	My stomach gets upset before or during competition.	○	○	○	○
20.	I am concerned I won't be able to concentrate.	○	○	○	○
21.	My heart pounds before competition.	○	○	○	○

Smith, Smoll & Schutz (1990)

Complete once every macro (i.e. 4 times a full season)

Appendix B

Causes of Anxiety in Sport Scale (CASS)

Adapted from: Marchant et al., 1997

Instructions:

In this questionnaire we would like you to reflect on particular situations you have experienced in your sport. When answering these questions focus on situations that produced anxiety (e.g., worries, concerns, fears) for yourself. Anxiety in sport is common. Virtually all athletes have experienced anxiety at some time or another. Anxiety can be caused by a wide range of sources. This questionnaire is designed to allow you to rate how some of these possible causes affect you during practice and competition, and how frequently, how intensely, and whether you are concerned or not. We want you to answer these questions as honestly and openly as you possibly can. (Only we will see the answers.) This is not a test, and there are no right or wrong, good or bad answers. Please be patient because you may find that some of these questions seem repetitious. From this information we hope to help you cope better with your anxiety levels, especially if these should be a problem. Thank you very much for your assistance.

John Hogg

Personal details:

Name: ______________________ Club: ______________________

Address: ______________________ Coach: ______________________

Postal Code: __________ Age in yrs.: ______________________

Male: ☐ Female: ☐ Best Stroke/Event: ______________________

Best Time for Stroke/Event: __________ scm __________ lcm

Years of Competitive Swimming Experience: __

Level of Ability - Currently - Please tick highest level you have currently attained.

SNR National Team	☐	Provincial A Time(s)	☐
National Qualifier	☐	Provincial B Time (s)	☐
CIAU Qualifier	☐	Club Swimmer	☐

Please note: The data gathered from this questionnaire will be treated confidentially. The data will be shared with you only. It will be up to you whether you choose to share your data with others.

Please rate the following statements in relation to how you generally feel based on previous experiences in your sport. For each statement circle the number that best represents how the statement applies to you for both frequency, intensity, and whether you are concerned or not (yes or no). Be sure to answer all questions, and circle only one number for each statement. Remember to focus your response on how you generally feel. Address all 3 columns.

Frequency: Never - 1 Rarely - 2 Sometimes - 3 Often - 4 Always - 5
Intensity: Non existent - 1 Low - 2 Moderate - 3 High - 4
Concerned: Yes = Y No = N

In general ...

	Frequency	*Intensity*	*Concern*
1. I worry when the swimming competition is very important.	1 2 3 4 5	1 2 3 4	Y N
2. I get nervous when the coach, media, spectators or observers criticise me.	1 2 3 4 5	1 2 3 4	Y N
3. I become nervous before I swim in important races.	1 2 3 4 5	1 2 3 4	Y N
4. I get nervous because I feel I'm not as good as other competitors.	1 2 3 4 5	1 2 3 4	Y N
5. I become anxious when I think that others are watching my race.	1 2 3 4 5	1 2 3 4	Y N
6. I become stressed and tense by putting pressure on myself to perform to my best.	1 2 3 4 5	1 2 3 4	Y N
7. When I fail to reach my performance goals I become anxious, upset or frustrated.	1 2 3 4 5	1 2 3 4	Y N
8. When I train poorly I feel nervous about competing.	1 2 3 4 5	1 2 3 4	Y N
9. When things in my personal life are not going well then I worry about this in training and competition.	1 2 3 4 5	1 2 3 4	Y N
10. I worry a lot when the competition is really tough.	1 2 3 4 5	1 2 3 4	Y N
11. I am concerned about not swimming well in my main event(s).	1 2 3 4 5	1 2 3 4	Y N
12. When I swim/race in front of a crowd then I worry about making mistakes.	1 2 3 4 5	1 2 3 4	Y N
13. I want others (crowd, family, teammates) to see me performing well.	1 2 3 4 5	1 2 3 4	Y N
14. Uncertainty in competition makes me nervous.	1 2 3 4 5	1 2 3 4	Y N
15. I become nervous and upset when I feel the race is slipping away from me.	1 2 3 4 5	1 2 3 4	Y N
16. I get worried about my physical preparation before competition.	1 2 3 4 5	1 2 3 4	Y N
17. When I make a mistake or fail to do well in training or competition I worry about what others are thinking.	1 2 3 4 5	1 2 3 4	Y N
18. I worry that I will let down my coach.	1 2 3 4 5	1 2 3 4	Y N
19. I become worried when I think officials could disqualify me unfairly.	1 2 3 4 5	1 2 3 4	Y N
20. I am concerned that my techniques will break down.	1 2 3 4 5	1 2 3 4	Y N
21. I get uptight when I know my coach expects me to perform well.	1 2 3 4 5	1 2 3 4	Y N
22. I get nervous during swimming competition because outside pressures and distractions interfere with my performance.	1 2 3 4 5	1 2 3 4	Y N
23. I become nervous when other competitors are doing better than me.	1 2 3 4 5	1 2 3 4	Y N
24. I worry in an individual race or a team relay about the possibility of the result hinging on me.	1 2 3 4 5	1 2 3 4	Y N
25. I get nervous when I think of screwing up in front of a large crowd.	1 2 3 4 5	1 2 3 4	Y N
26. I often worry about my recent training form.	1 2 3 4 5	1 2 3 4	Y N
27. I become uptight and distracted during a competition when I am trying to cope with family or other problems.	1 2 3 4 5	1 2 3 4	Y N

Marchant et al. (1997)

Appendix C

The Carolina Sport Confidence Inventory

What am I like
These are statements which allow people to describe themselves.
There are no right or wrong answers since people differ.
First, decide which one of the two statements best describes you.

Then go to that side of the statement and check if it is "somewhat true" or "very true" for you.

Remember to check only one of the four boxes

	Very True For Me	Somewhat True For Me				Somewhat True For Me	Very True For Me
1	☐	☐	I feel I am not very good when it comes to playing sports.	*or*	I feel I am really good at many sports.	☐	☐
2	☐	☐	I always look on the bright side when it comes to sports.	*or*	I think of the bad things that might occur when I play sports.	☐	☐
3	☐	☐	In the company of my peers I feel that I am always one of the best when it comes to joining sport activities.	*or*	In the company of my peers I am not among the best when it comes to joining in sports activities.	☐	☐
4	☐	☐	I feel that I am among the best in my peer group when it comes to athletic ability.	*or*	I feel that I am average or below my peers when it comes to athletic ability.	☐	☐
5	☐	☐	I feel that if something can go wrong for me during sports activities, it will.	*or*	I feel that if something can go right for me during sports activities, it will.	☐	☐
6	☐	☐	I feel that things will never work out the way I wanted them to, during sporting activities.	*or*	I believe that things will work out for me, during sporting activities.	☐	☐
7	☐	☐	I am not quite so confident when it comes to taking part in sporting activities.	*or*	I am among the most confident when it comes to taking part in sporting activities.	☐	☐
8	☐	☐	I believe that I have a bright future in sporting activities	*or*	I feel that the worst is yet to come for me in sporting activities.	☐	☐

	Very True For Me	Somewhat True For Me				Somewhat True For Me	Very True For Me
9	☐	☐	I am a little slower than most when it comes to learning new skills in a sports situation.	*or*	I always seem to be among the quickest when it comes to learning a new sport skill.	☐	☐
10	☐	☐	I hardly ever expect things to go my way in sporting activities.	*or*	I feel that things will often go my way in sporting activities.	☐	☐
11	☐	☐	I believe that during sporting activities "every cloud" has a silver lining.	*or*	I have trouble during sporting activities seeing the "light at the end of the tunnel".	☐	☐
12	☐	☐	Given the chance, I am always the first to join in sports activities.	*or*	I sometimes hold back and am not usually the first to join in sport activities.	☐	☐
13	☐	☐	I feel that there is no use in really trying to get something I want in sport because I probably will not get it.	*or*	I believe that if you work hard enough you will attain your sports goals.	☐	☐

Appendix D

Sport Motivation Scale (SMS)

Why Do You Practice Your Sport?

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

		Does not correspond at all		Corresponds moderately			Corresponds exactly	
1.	**For the pleasure I feel in living exciting experiences.**	1	2	3	4	5	6	7
2.	**For the pleasure it give me to know more about the sport that I practice.**	1	2	3	4	5	6	7
3.	**I used to have good reasons for doing sports, but now I am asking myself if I should continue doing it.**	1	2	3	4	5	6	7
4.	**For the pleasure of discovering new training techniques.**	1	2	3	4	5	6	7
5.	**I don't know anymore; I have the impression that I am incapable of succeeding in this sport.**	1	2	3	4	5	6	7
6.	**Because it allows me to be well regarded by people that I know.**	1	2	3	4	5	6	7
7.	**Because, in my opinion, it is one of the best ways to meet people.**	1	2	3	4	5	6	7
8.	**Because I feel a lot of personal satisfaction while mastering certain difficult training techniques.**	1	2	3	4	5	6	7
9.	**Because it is absolutely necessary to do sports if one wants to be in shape.**	1	2	3	4	5	6	7
10.	**For the prestige of being an athlete.**	1	2	3	4	5	6	7
11.	**Because it is one of the best ways I have chosen to develop other aspects of myself.**	1	2	3	4	5	6	7
12.	**For the pleasure I feel while improving some of my weak points.**	1	2	3	4	5	6	7
13.	**For the excitement I feel when I am really involved in the activity.**	1	2	3	4	5	6	7
14.	**Because I must do sports to feel good about myself.**	1	2	3	4	5	6	7
15.	**For the satisfaction I experience while I am perfecting my abilities**	1	2	3	4	5	6	7
16.	**Because people around me think it is important to be in shape.**	1	2	3	4	5	6	7
17.	**Because it is a good way to learn lots of things which could be useful to me in other areas of my life.**	1	2	3	4	5	6	7
18.	**For the intense emotions that I feel while I am doing a sport that I like**	1	2	3	4	5	6	7
19.	**It is not clear to me anymore; I don't really think my place is in sport.**	1	2	3	4	5	6	7
20.	**For the pleasure that I feel while executing certain difficult movements.**	1	2	3	4	5	6	7
21.	**Because I would feel bad if I was not taking time to do it.**	1	2	3	4	5	6	7
22.	**To show others how good I am at my sport.**	1	2	3	4	5	6	7
23.	**For the pleasure that I feel while learning training techniques that I have never tried before.**	1	2	3	4	5	6	7
24.	**Because it is one of the best ways to maintain good relationships with my friends.**	1	2	3	4	5	6	7
25.	**Because I like the feeling of being totally immersed in the activity.**	1	2	3	4	5	6	7
26.	**Because I must do sports regularly.**	1	2	3	4	5	6	7
27.	**For the pleasure of discovering new performance strategies.**	1	2	3	4	5	6	7
28.	**I often ask myself; I can't seem to achieve the goals that I set for myself.**	1	2	3	4	5	6	7

Appendix E

Competitive State Anxiety Inventory (CSAI-2)

Name: ______________________________ Sex: ☐ M ☐ F Date: ____________________

Directions: A number of statements that athletes have used to describe their feelings before competition are given below. Read each statement and then blacken out ● the appropriate number to the right of the statement to indicate *how you feel right now* - at this moment. There are no right or wrong answers. Do *not* spend too much time on any one statement, but choose the answer which describes your feelings *right now*.

Not at all: 0 Somewhat: 1 Moderately so: 2 Very much so: 3

		0	*1*	*2*	*3*
1.	I am concerned about this competition.	○	○	○	○
2.	I feel nervous.	○	○	○	○
3.	I feel at ease.	○	○	○	○
4.	I have self-doubts.	○	○	○	○
5.	I feel jittery.	○	○	○	○
6.	I feel comfortable.	○	○	○	○
7.	I am concerned that I may not do as well in this competition as I could.	○	○	○	○
8.	My body feels tense.	○	○	○	○
9.	I feel self-confident.	○	○	○	○
10.	I am concerned about losing.	○	○	○	○
11.	I feel tense in my stomach.	○	○	○	○
12.	I feel secure.	○	○	○	○
13.	I am concerned about choking under pressure.	○	○	○	○
14.	My body feels relaxed.	○	○	○	○
15.	I'm confident I can meet the challenge.	○	○	○	○
16.	I'm concerned about performing poorly.	○	○	○	○
17.	My heart is racing.	○	○	○	○
18.	I'm confident about performing well.	○	○	○	○
19.	I'm concerned about reaching my goal.	○	○	○	○
20.	I feel my stomach sinking.	○	○	○	○
21.	I feel mentally relaxed.	○	○	○	○
22.	I'm concerned that others will be disappointed with my performance.	○	○	○	○
23.	My hands are clammy.	○	○	○	○
24.	I'm confident because I mentally picture myself reaching my goal.	○	○	○	○
25.	I'm concerned I won't be able to concentrate.	○	○	○	○
26.	My body feels tight.	○	○	○	○
27.	I'm confident of coming through under pressure.	○	○	○	○

(Martens et al., 1990)

Appendix F

Mental Readiness Form (MRF) For Performance
(Adapted from Murphy et al., 1989)

Name: ______________________ **Competition:** ____________ ________
Event: ______________________ **Date:** ______________________

Below are three 10-centimeter lines. With a vertical line please indicate how you feel at this present moment on the scale provided. Please complete this 5-10 mins. Before you perform.

Mentally Calm ***Worried***
1 2 3 4 5 6 7 8 9 10

Tense ***Relaxed***
1 2 3 4 5 6 7 8 9 10

Confident ***Scared***
1 2 3 4 5 6 7 8 9 10

Do M1-5 5-10 mins. before you swim your main event(s)

Appendix G

RESTQ - Sport

- This questionnaire consists of a series of statements. These statements possibly describe your psychic or physical well-being or your activities the past few days and nights.
- Please select the answer that most accurately reflects your thoughts and activities. Indicate how often each statement was right in your case in the past days.
- The statements related to performance should refer to performance during competition as well as during practice.
- For each statement there are seven possible answers.
- Please make your selection by marking the number corresponding to the appropriate answer.

Example:

In the past (3) days/nights
... I read a newspaper

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

- In this example, the number 5 is marked. This means that you read a newspaper very often in the past several days.
- Please do not leave any statements blank.
- If you are unsure which answer to choose, select the one that most closely applies to you.
- Please turn the page and respond to the statements in order without interruption.

Dates	Administration of RESTQ	Training Phase	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

In the past (3) days/nights

1. ... I watched TV

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

2. ... I did not get enough sleep

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

3. ... I finished important tasks

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

4. ... I was unable to concentrate well

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

5. ... everything bothered me

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

6. ... I laughed

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

7. ... I felt physically bad

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

8. ... I was in a bad mood

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

9. ... I felt physically relaxed

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

10\.... I was in good spirits

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

11\.... I had difficulties in concentrating

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

12\.... I worried about unresolved problems

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

13\.... I felt at ease

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

14. ... I had a good time with friends

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

15. ... I had a headache

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

16. ... I was tired from work

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

17. ... I was successful in what I did

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

18. ... I couldn't switch my mind off

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

19. ... I fell asleep satisfied and relaxed

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

20. ... I felt uncomfortable

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

21. ... I was annoyed by others

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

22. ... I felt down

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

23. ... I visited some close friends

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

24. ... I felt depressed

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

25. ... I was dead tired after work

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

26. ... other people got on my nerves

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

27. ... I had a satisfying sleep

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

28. ... I felt anxious or inhibited

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

29. ... I felt physically fit

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

30. ... I was fed up with everything

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

31. ... I was lethargic

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

32. ... I felt I had to perform well in front of others

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

33. ... I had fun

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

34. ... I was in a good mood

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

35. ... I was overtired

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

36. ... I slept restlessly

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

37. ... I was annoyed

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

38. ... I felt as if I could get everything done

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

39. ... I was upset

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

40. ... I put off making decisions

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

41. ... I made important decisions

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

42. ... I felt physically exhausted

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

43. ... I felt happy

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

44. ... I felt under pressure

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

45. ... everything was too much for me

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

46. ... my sleep was interrupted easily

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

47. ... I felt content

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

48. ... I was angry with someone

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

49. ... I had some good ideas

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

50. ... parts of my body were aching

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

51. ... I could not get rest during the breaks

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

52. ... I was convinced I could achieve my set goals during performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

53. ... I recovered well physically

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

54. ... I felt burned out by my sport

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

55. ... I accomplished many worthwhile things in my sport

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

56. ... I prepared myself mentally for performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

57. ... my muscles felt stiff or tense during performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

58. ... I had the impression there were too few breaks

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

59. ... I was convinced that I could achieve my performance at any time

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

60. ... I dealt very effectively with my teammates' problems

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

61. ... I was in a good condition physically

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

62. ... I pushed myself during performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

63. ... I felt emotionally drained from performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

64. ... I had muscle pain after performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

65. ... I was convinced that I performed well

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

66. ... too much was demanded of me during the breaks

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

67. ... I psyched myself up before performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

68. ... I felt that I wanted to quit my sport

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

69. ... I felt very energetic

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

70. ... I easily understood how my teammates felt about things

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

71. ... I was convinced that I had trained well

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

72. ... the breaks were not at the right times

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

73. ... I felt vulnerable to injuries

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

74. ... I set definite goals for myself during performance

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

75. ... my body felt strong

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

76. ... I felt frustrated by my sport

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

77. ... I dealt with emotional problems in my sport very calmly

0	1	2	3	4	5	6
never	seldom	sometimes	often	more often	very often	always

Thank you very much!

Appendix H

Pre-Competition Profile of Mood States (POMS)

Name: ______________________ **Event:** ______________ **Date:** ________ **Best time:** _______

Below is a list of words that describe feelings people have. Please read each word carefully. Some words refer to more POSITIVE feelings, while others describe more NEGATIVE feelings. Do not spend too much time on any one word. Blacken out ● the one number that best describes how you feel at this present moment about your upcoming major competition.

Not at all: 0 A little bit: 1 Moderately: 2 Quite a bit: 3 Extremely: 4

		0	*1*	*2*	*3*	*4*			*0*	*1*	*2*	*3*	*4*
1.	Tense	○	○	○	○	○	21.	Discouraged	○	○	○	○	○
2.	Angry	○	○	○	○	○	22.	Resentful	○	○	○	○	○
3.	Worn out	○	○	○	○	○	23.	Nervous	○	○	○	○	○
4.	Unhappy	○	○	○	○	○	24.	Miserable	○	○	○	○	○
5.	Proud	○	○	○	○	○	25.	Confident	○	○	○	○	○
6.	Lively	○	○	○	○	○	26.	Bitter	○	○	○	○	○
7.	Confused	○	○	○	○	○	27.	Exhausted	○	○	○	○	○
8.	Sad	○	○	○	○	○	28.	Anxious	○	○	○	○	○
9.	Active	○	○	○	○	○	29.	Helpless	○	○	○	○	○
10.	On-edge	○	○	○	○	○	30.	Weary	○	○	○	○	○
11.	Grouchy	○	○	○	○	○	31.	Satisfied	○	○	○	○	○
12.	Ashamed	○	○	○	○	○	32.	Bewildered	○	○	○	○	○
13.	Energetic	○	○	○	○	○	33.	Furious	○	○	○	○	○
14.	Hopeless	○	○	○	○	○	34.	Full of pep	○	○	○	○	○
15.	Uneasy	○	○	○	○	○	35.	Worthless	○	○	○	○	○
16.	Restless	○	○	○	○	○	36.	Forgetful	○	○	○	○	○
17.	Unable to concentrate	○	○	○	○	○	37.	Uncertain about things	○	○	○	○	○
18.	Fatigued	○	○	○	○	○	38.	Vigorous	○	○	○	○	○
19.	Competent	○	○	○	○	○	39.	Bushed	○	○	○	○	○
20.	Annoyed	○	○	○	○	○	40.	Embarrassed	○	○	○	○	○

Grove & Prapavessis, 1992 JMH'2000

Complete above 20-30 mins. before your main event(s) or night before. Be consistent when you complete the form each time. Answer below now.

Instructions: For these 2 items circle the appropriate number (0-6) to indicate your existing states of importance and competence NOW.

	Not at all						*Extremely*
• How important is this upcoming game for you?	0	1	2	3	4	5	6
• How ready/competent/capable of performing are you?	0	1	2	3	4	5	6

Do for both heats/finals

Post-Competition Profile of Mood States (POMS)

Name: ______________________________ **Date:** ___ ________________
Game: ____________________ **Final Score:** ______ **Estimated Time Played:** __________

Below is a list of words that describe feelings people have. Please read each word carefully. Some words refer to more POSITIVE feelings, while others describe more NEGATIVE feelings. Do not spend too much time on any one word. Blacken out ● the one number that best describes how you feel at this present moment now that you have played your major competition.

Not at all: 0 **A little bit: 1** **Moderately: 2** **Quite a bit: 3** **Extremely: 4**

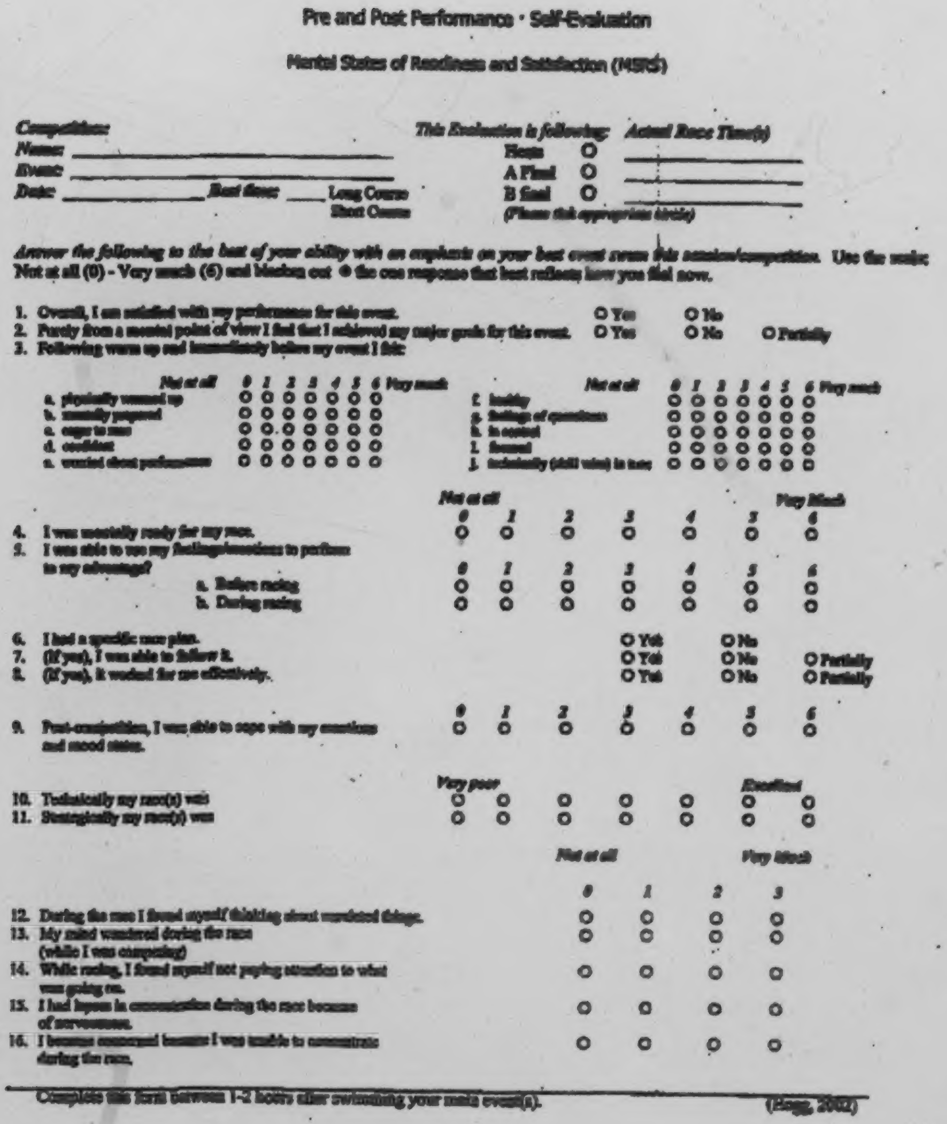
		0	*1*	*2*	*3*	*4*			*0*	*1*	*2*	*3*	*4*
1.	Tense	○	○	○	○	○	21.	Discouraged	○	○	○	○	○
2.	Angry	○	○	○	○	○	22.	Resentful	○	○	○	○	○
3.	Worn out	○	○	○	○	○	23.	Nervous	○	○	○	○	○
4.	Unhappy	○	○	○	○	○	24.	Miserable	○	○	○	○	○
5.	Proud	○	○	○	○	○	25.	Confident	○	○	○	○	○
6.	Lively	○	○	○	○	○	26.	Bitter	○	○	○	○	○
7.	Confused	○	○	○	○	○	27.	Exhausted	○	○	○	○	○
8.	Sad	○	○	○	○	○	28.	Anxious	○	○	○	○	○
9.	Active	○	○	○	○	○	29.	Helpless	○	○	○	○	○
10.	On-edge	○	○	○	○	○	30.	Weary	○	○	○	○	○
11.	Grouchy	○	○	○	○	○	31.	Satisfied	○	○	○	○	○
12.	Ashamed	○	○	○	○	○	32.	Bewildered	○	○	○	○	○
13.	Energetic	○	○	○	○	○	33.	Furious	○	○	○	○	○
14.	Hopeless	○	○	○	○	○	34.	Full of pep	○	○	○	○	○
15.	Uneasy	○	○	○	○	○	35.	Worthless	○	○	○	○	○
16.	Restless	○	○	○	○	○	36.	Forgetful	○	○	○	○	○
17.	Unable to concentrate	○	○	○	○	○	37.	Uncertain about things	○	○	○	○	○
18.	Fatigued	○	○	○	○	○	38.	Vigorous	○	○	○	○	○
19.	Competent	○	○	○	○	○	39.	Bushed	○	○	○	○	○
20.	Annoyed	○	○	○	○	○	40.	Embarrassed	○	○	○	○	○

Grove & Prapavessis, 1992 **JMH'2000**

Complete above 1-2 hours following your main event(s). Be consistent when you complete the form each time.

Do for both heats/finals.

Appendix I



Pre and Post Performance - Self-Evaluation

Mental States of Readiness and Satisfaction (MSRS)

Competition:		***This Evaluation is following:***	***Actual Race Time(s)***
Name: ______________________________		Heats ○	______________
Event: ______________________________		A Final ○	______________
Date: ______________ ***Best time:*** ____	Long Course Short Course	B final ○	______________
		(Please tick appropriate circle)	

Answer the following to the best of your ability with an emphasis on your best event swum this session/competition. Use the scale: Not at all (0) - Very much (6) and blacken out ● the one response that best reflects how you feel now.

1. Overall, I am satisfied with my performance for this event. ○ Yes ○ No
2. Purely from a mental point of view I feel that I achieved my major goals for this event. ○ Yes ○ No ○ Partially
3. Following warm up and immediately before my event I felt:

Not at all	*0*	*1*	*2*	*3*	*4*	*5*	*6 Very much*	*Not at all*	*0*	*1*	*2*	*3*	*4*	*5*	*6 Very much*
a. physically warmed up	○	○	○	○	○	○	○	f. healthy	○	○	○	○	○	○	○
b. mentally prepared	○	○	○	○	○	○	○	g. feelings of quickness	○	○	○	○	○	○	○
c. eager to race	○	○	○	○	○	○	○	h. in control	○	○	○	○	○	○	○
d. confident	○	○	○	○	○	○	○	i. focused	○	○	○	○	○	○	○
e. worried about performance	○	○	○	○	○	○	○	j. technically (skill wise) in tune	○	○	○	○	○	○	○

	Not at all						*Very Much*
	0	*1*	*2*	*3*	*4*	*5*	*6*
4. I was mentally ready for my race.	○	○	○	○	○	○	○
5. I was able to use my feelings/emotions to perform to my advantage?	*0*	*1*	*2*	*3*	*4*	*5*	*6*
a. Before racing	○	○	○	○	○	○	○
b. During racing	○	○	○	○	○	○	○

6. I had a specific race plan. ○ Yes ○ No
7. (If yes), I was able to follow it. ○ Yes ○ No ○ Partially
8. (If yes), it worked for me effectively. ○ Yes ○ No ○ Partially

	0	*1*	*2*	*3*	*4*	*5*	*6*
9. Post-competition, I was able to cope with my emotions and mood states.	○	○	○	○	○	○	○

	Very poor					*Excellent*	
10. Technically my race(s) was	○	○	○	○	○	○	○
11. Strategically my race(s) was	○	○	○	○	○	○	○

	Not at all			*Very Much*
	0	*1*	*2*	*3*
12. During the race I found myself thinking about unrelated things.	○	○	○	○
13. My mind wandered during the race (while I was competing)	○	○	○	○
14. While racing, I found myself not paying attention to what was going on.	○	○	○	○
15. I had lapses in concentration during the race because of nervousness.	○	○	○	○
16. I became concerned because I was unable to concentrate during the race.	○	○	○	○

Complete this form between 1-2 hours after swimming your main event(s). (Hogg, 2002)

Appendix J

"Athlete-Generated Instrument" (AGI)

Name: ______________________ **Date:** ______________________
Event: ______________________ **Competition:** ____ ______________

Anxiety

1 2 3 4 5 6 7 8 9 ⋮ 10

Uncertainty *Certainty*

Motivation

1 2 3 4 5 6 7 8 9 ⋮ 10

Lack of Excitement/Nervous *Driven*

Confidence

1 2 3 4 5 6 7 8 9 ⋮ 10

Lack of Passion *Proud*

Concentration

1 2 3 4 5 6 7 8 9 ⋮ 10

Distracted *Focused/Ready*

Appendix K

UNIVERSITY OF ALBERTA

Information Letter

Dear Parent/Guardian/Participant:

I am a masters student at the University of Alberta under the guidance of Dr. John M. Hogg looking at the performance patterns of an elite swimmer across a season. Your child is being invited to participate in this study. There are three reasons for this study: (1) to become aware of the swimmer's mental states and how they affect performance; (2) to determine how often, how intense, and how common these mental states are; and (3) to create a mental training program that could be helpful for swimmers and coaches.

This study involves:

Being in two 45-50 minute interviews at the start and at the end of your swim season. The first interview will help us to make a personal checklist for you to fill out before your main event during the season (September 2002-February 2003). The second interview will help you to review your performances (both mentally and physically) so that you can make changes for the following season.

Observing your mental states before and after your main event over the season. You will fill out four measures at the start and at the end of the season. Each measure will take about five minutes for a total of forty minutes. In addition, at every swim meet, you will fill out four pre race measures and two post race measures each taking about five minutes. This means thirty minutes at each swim meet for a total of four hours. Finally, you will fill out another measure six times throughout the season. Each of these measures will take about seven minutes for a total of forty-two minutes. The total time needed for this study will be about seven and a half hours (including the two interviews).

All the data you give will be kept private. Your data will not be shared with your coaches, parents, or any others not in the study. The data will be coded with your own ID number. It will be kept for an unknown period of time and in a locked cabinet in the locked office of Dr. John Hogg at the University of Alberta. If you would like to see your results, you can call Dr. John Hogg. The data you provide may help you understand your best performances. You will not be in any physical or mental danger during this study.

The University of Alberta creates and collects information for research and other activities for education and research programs. All the people in their research projects are told that the information they give, and any other information gathered for research projects, will be protected. This is in agreement with the Alberta Freedom of Information and Protection of Privacy Act.

You may choose not to sign up for this study. Once you are in the study you may drop out, for any reason, and there will be no negative penalties. You may also ask that your data be taken out altogether from the study. Any results from this study may be used for research purposes only. The results will be written in a thesis paper and presented to a graduate studies committee. The results may be presented or published in journals. However, the data will be presented and you will not be identified. The data taken from you in this study will not be used for any future work without your consent. If you have any questions, please call Dr. John Hogg at the University of Alberta (492-2830). If you wish to speak to someone who is not involved in this study, please call Dr. Wendy Rodgers. She is the Chair of the Ethics Committee (Research and Graduate Studies), Faculty of Physical Education and Recreation at 492-5910.

If you are under 18 years of age, your parent or guardian's written consent is also needed. Please ask your parent or guardian to read through this form carefully. Both of you should sign the attached consent form if you both agree that you (the swimmer aged under 18) will participate in this study. Thank you.

Sincerely,

Fahreen Rayani

UNIVERSITY OF ALBERTA

Consent Form

Title: Monitoring Psychological Variables in an Elite Competitive Swimmer Across a Season: An Application of the IZOF Model

Principal Investigator: Fahreen Rayani
Telephone: 436-0785

Supervisor: Dr. John M. [illegible]
Telephone: 492-2830

By signing this form I consent that I, ______________________________ (name of participant) will participate in this research study. In doing so, I will complete and understand the following:

1. Do you understand that you have been asked to be in a research study? Yes No

2. Have you read and received a copy of the attached Information Sheet? Yes No

3. Do you understand the benefits and risks involved in taking part in this research study? Yes No

4. Have you had the opportunity to ask questions and discuss the study? Yes No

5. Do you understand that you are free to refuse to participate or withdraw from the study at any time, without consequence, and that any information that you may have provided will be withdrawn at your request? Yes No

6. Has the issue of confidentiality been explained to you? Do you understand who will have access to your information? Yes No

7. I understand that I will receive a signed copy of this consent form.

This study was explained to me by: ______________________________

______________________________ Signature of parent/guardian

______________________________ Signature of participant

______________________________ Date

______________________________ Investigator

Faculty of Physical Education and Recreation

E424 Van Vliet Centre · University of Alberta · Edmonton · Canada · T6G 2H9
Telephone: (780) 492-2830 · Fax: (780) 492-2364

Appendix L

Athlete A **Questionnaire Schedule**

		CASS	SAS	CSCI	SMS	CSAI-2	MRF	POMS	[illegible]	AGI
Trait #1	October	✓	✓	✓	✓					
Edmonton	(Kayano Cup #1) October 19					✓	✓	✓	✓	✓
Saskatchewan	(Goldline Invitational) October 24-27					✓	✓	✓	✓	✓
RESTQ #1	November 15									
Edmonton	(Kayano Cup #2) November 16					✓	✓	✓	✓	✓
Edmonton	(Nationals) Nov. 28 – Dec. 1					✓	✓	✓	✓	✓
Minneapolis	(US Open) December 5-7					✓	✓	✓	✓	✓
Edmonton	(Kayano Cup #3) December 14					✓	✓	✓	✓	✓
Australia	(Junior Pan Pacs) Dec. 26 – Jan. 3					✓	✓	✓	✓	✓
RESTQ #2	January 27									
RESTQ #3	February 10									
Regina	(Western Cup) February 19-24					✓	✓	✓	✓	✓
Calgary	(Canada Cup) March 7-9					✓	✓	✓	✓	✓
RESTQ #4	March 10									
Indianapolis	(US Nationals) April 1-6					✓	✓	✓	✓	✓
Trait #2	April	✓	✓	✓	✓					

Appendix M

Pre Season Interview Guide

From the following list of words, please select *at least* one item from each factor (or add your own) that best characterizes your psychological state prior to performance.

Anxiety

nervous, tense, concerned, worried, tight, stressed, upset, frustrated, uncertain, jittery, pressure, scared inhibited, pounding heart, butterflies, stomach ache, choke

Motivation

satisfied, activated, impulse, induced, inspired, provoked, agitated, excited, aroused, mobilized, tempted, enticed, driven

Confidence

proud, satisfied, challenged, comfortable, assured, poised, certain, hopeful, secure

Concentration

wander, distracted, unfocused, lack of attention, centered

Recovery-Stress

sleep, laugh, bad mood, good spirits, unresolved problems, ease, successful, uncomfortable, annoyed, burned-out, injured, sore, tired, fun, restless, lack of rest, stiff, tense, drained, energetic, frustrated, strong

Mood states

angry, unhappy, proud, lively, confused, sad, on edge, grouchy, ashamed, hopeless, uneasy, tired, competent, annoyed, discouraged, resentful, nervous, miserable, confident, bitter, exhausted, anxious, helpless, weary, satisfied, furious, bewildered, worthless, forgetful, uncertain, vigorous, embarrassed, frustrated

- Once the words have been chosen the interview will be conducted by asking the participant for each item they have chosen: *What does this word mean to you?*

Appendix N

Post Season Interview Guide

1. Now that you have completed the questionnaire portion of the study, what did you think of the process?
    - Good things and bad things
    - Did you find that it was difficult to complete the forms at competition?
    - Did it interfere at all with your preparations?
    - What did you like or not like about filling out the questionnaires?

2. When you reflect on the past seven months, is there anything that you learned about yourself?
3. Looking back on your performances, what was the difference between your best and your worst performance?
4. Do you think that your performances were consistent and in control or inconsistent?
5. If there is anything you could change over the past seven months, what would it be?
6. Overall, were you satisfied with your performances? If yes, what was good about them and if no, what would you like to improve?
7. What emotions do you have when you are ready to perform versus not ready to perform?
8. What is the intensity of these emotions? What do you think is the optimal level necessary for you to perform your best?
9. Did you ever feel burned out (emotionally and/or physically) throughout the past seven months?
10. Did you suffer from any injuries?
11. Did you feel that you could not handle the pressure of swimming (emotionally and/or physically)?
12. What were some ways that you recovered from the high volume training?
13. What are some things you like to do during your recovery periods?
14. How does recovery affect your performance?
15. How would you describe your levels of confidence in the past seven months? What were some things that boosted your confidence? What were some things that decreased your confidence?
16. How would you describe your motivation levels the past seven months? What were some things that increased your motivation? What were some things that decreased your motivation?
17. How do you perceive your anxiety? Do you think it helps or limits your performance? What are some things that increase your anxiety? What are some things that decrease your performance?
18. Did you ever find your mind wandering during training? What may have caused you to lose your focus?
19. Did you ever find your mind wandering during competition? What may have caused you to lose your focus?
20. During a race, is there anything that causes you to lose concentration? How does this affect the outcome of your race? Are you able to recover?

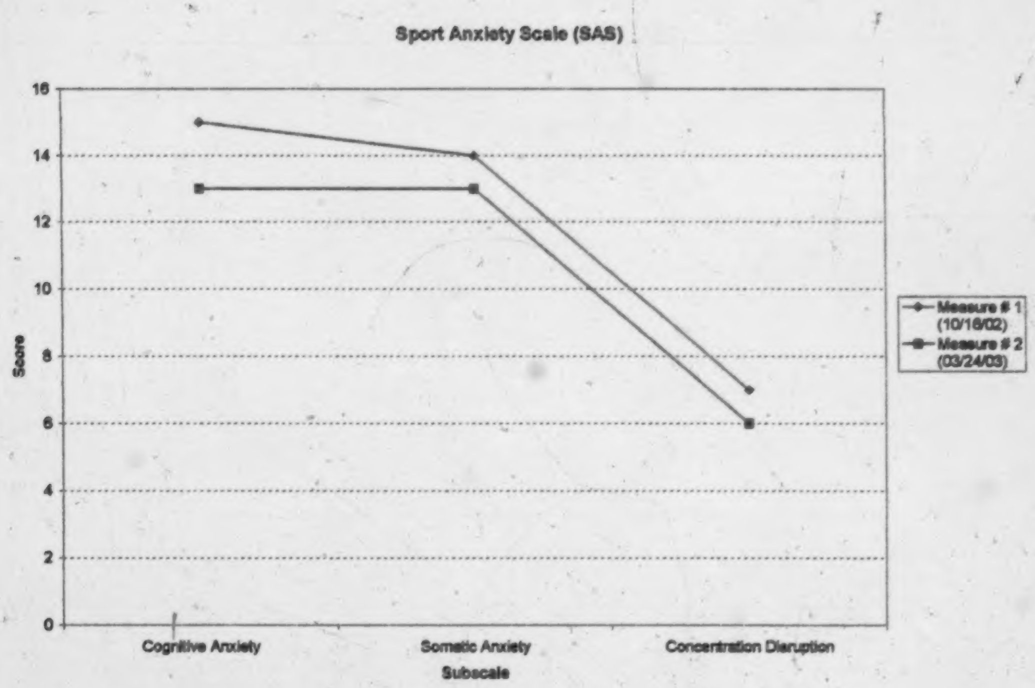
Appendix O

Five Core Debriefing Questions

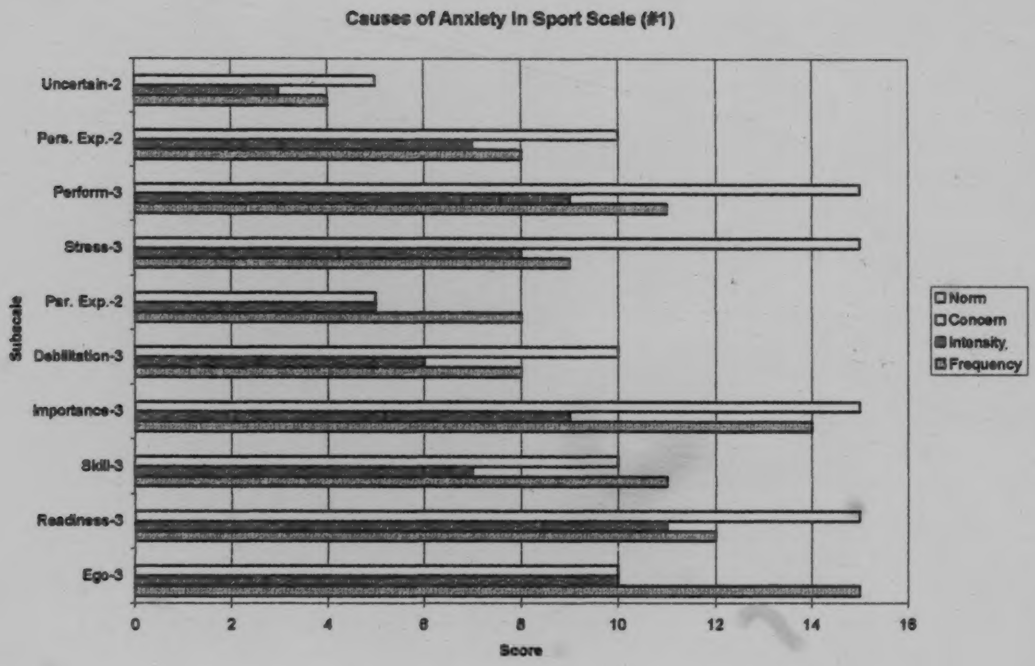
1. What happened exactly? … for you? … for the team?
2. What is the impact of your performance on you? … on the team?
3. How did your performance make you feel?
4. What did you learn – technically, physically, tactically, and mentally?
5. What are you encouraged to repeat or do differently for the next game/competition?

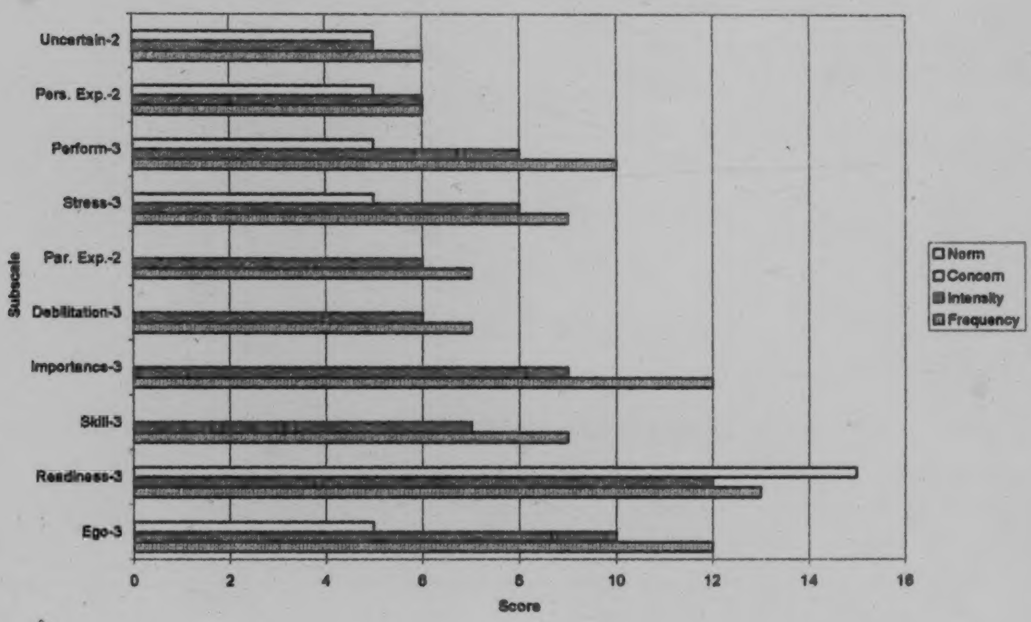
(Hogg, 2002)

Appendix P


Sport Anxiety Scale (SAS)
16
14
12
10
8
6
4
2
0
Score
Cognitive Anxiety
Somatic Anxiety
Concentration Disruption
Subscale
Measure # 1 (10/16/02)
Measure # 2 (03/24/03)

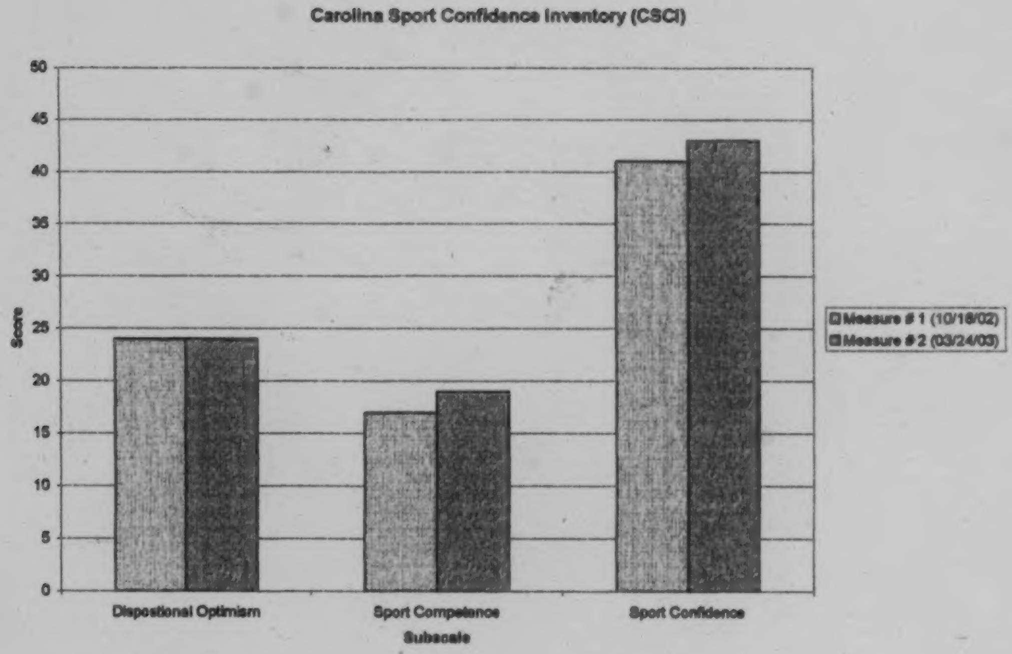
Appendix Q


Causes of Anxiety in Sport Scale (#1)
Subscale
Uncertain-2
Pers. Exp.-2
Perform-3
Stress-3
Par. Exp.-2
Debilitation-3
Importance-3
Skill-3
Readiness-3
Ego-3
0
2
4
6
8
10
12
14
16
Score
☐ Norm
☐ Concern
▨ Intensity
▨ Frequency

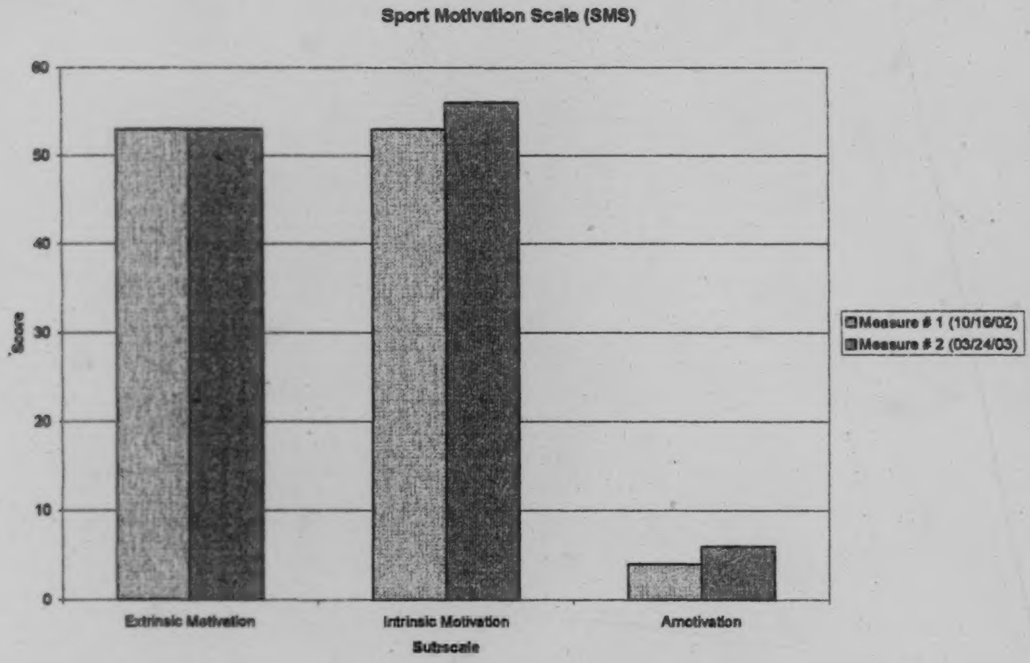


Causes of Anxiety in Sport Scale (#2)

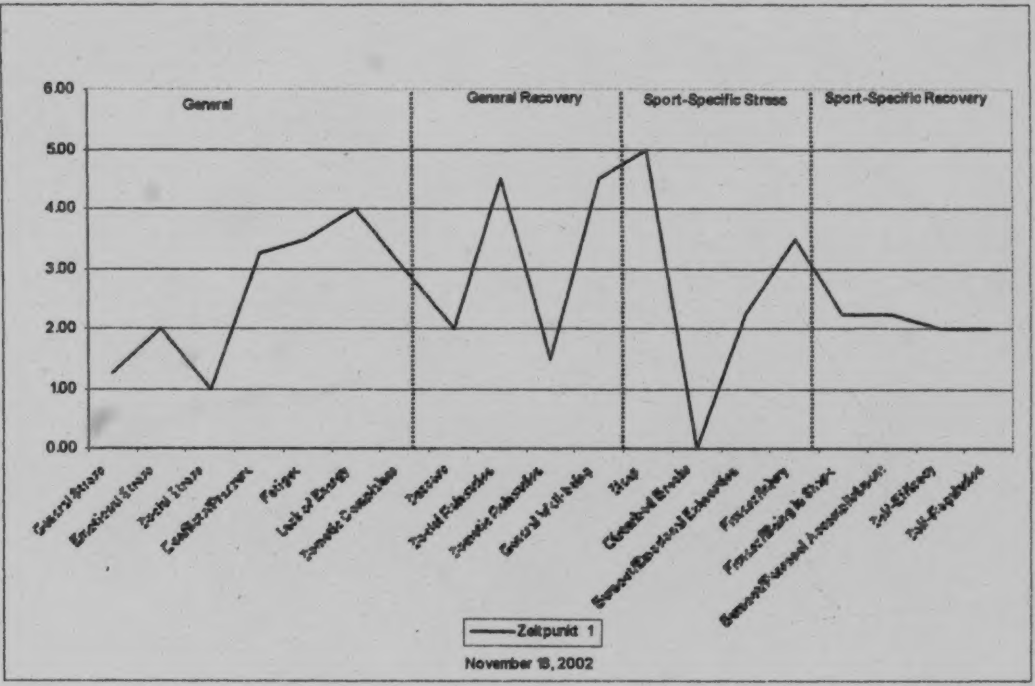
Appendix R


Carolina Sport Confidence Inventory (CSCI)
Score
50
45
40
35
30
25
20
15
10
5
0
Dispositional Optimism
Sport Competence
Sport Confidence
Subscale
▨ Measure # 1 (10/18/02)
▨ Measure # 2 (03/24/03)

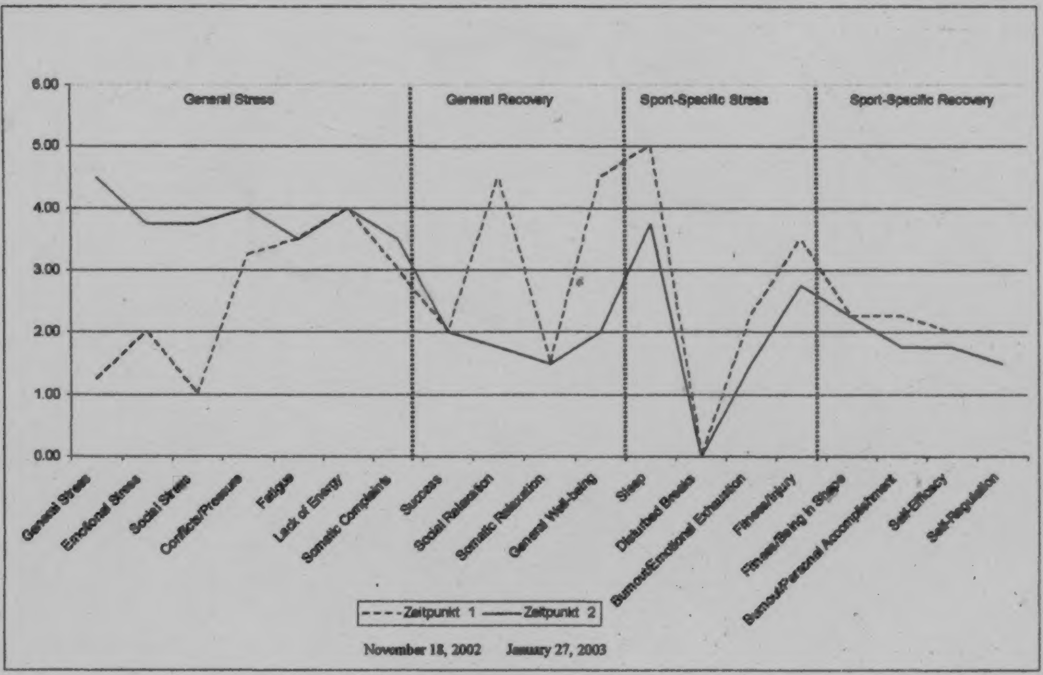
Appendix S

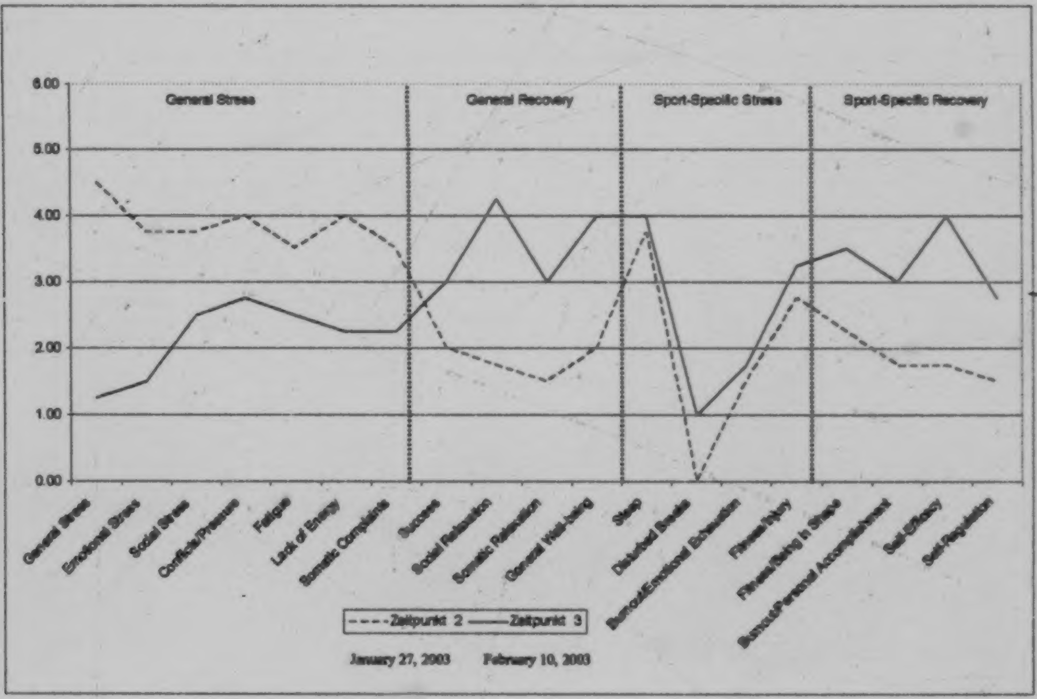

Sport Motivation Scale (SMS)
Score
60
50
40
30
20
10
0
Extrinsic Motivation
Intrinsic Motivation
Amotivation
Subscale
Measure # 1 (10/16/02)
Measure # 2 (03/24/03)

Appendix T Rest and Recovery Graphs

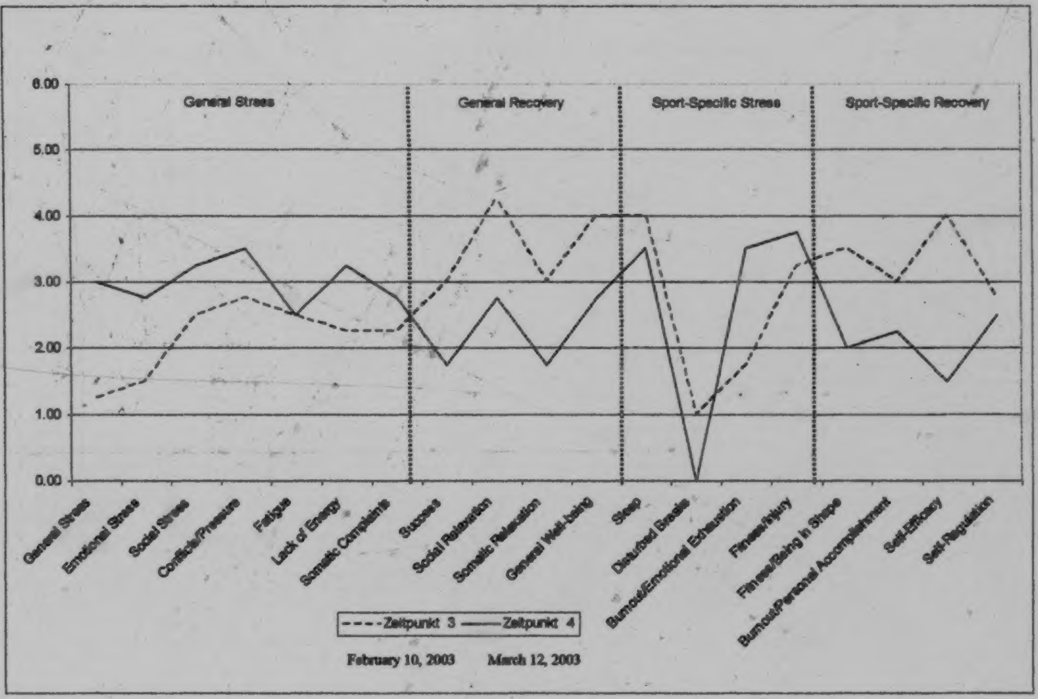


November 18, 2002

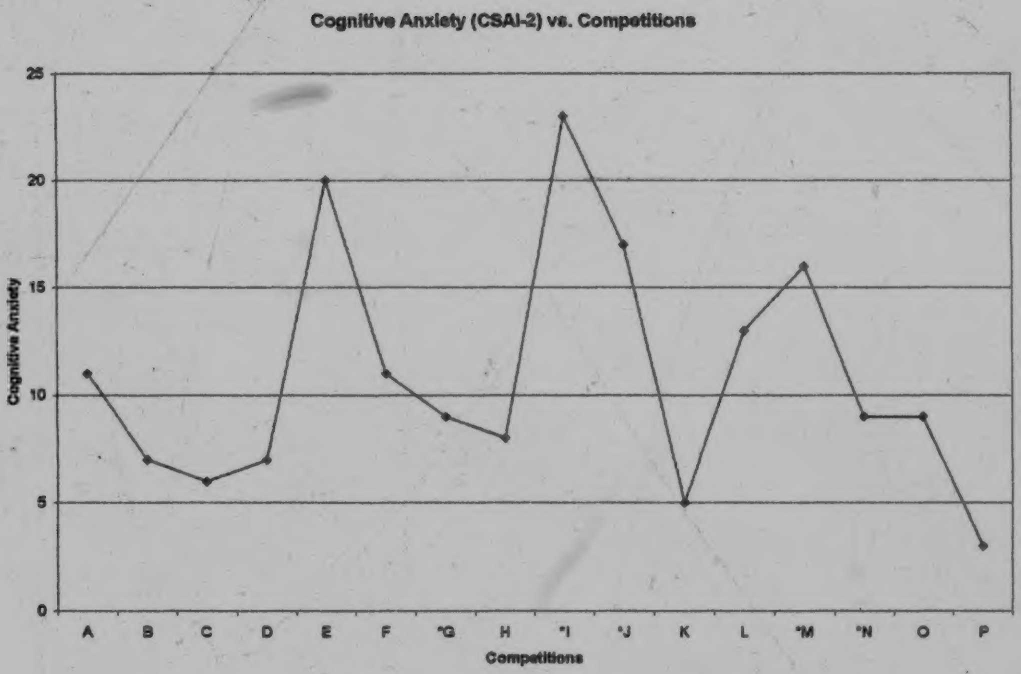

6.00
5.00
4.00
3.00
2.00
1.00
0.00
General Stress
General Recovery
Sport-Specific Stress
Sport-Specific Recovery
General Stress
Emotional Stress
Social Stress
Conflicts/Pressure
Fatigue
Lack of Energy
Somatic Complaints
Success
Social Relaxation
Somatic Relaxation
General Well-being
Sleep
Disturbed Breaks
Burnout/Emotional Exhaustion
Fitness/Injury
Fitness/Being in Shape
Burnout/Personal Accomplishment
Self-Efficacy
Self-Regulation
Zeitpunkt 1
Zeitpunkt 2
November 18, 2002
January 27, 2003



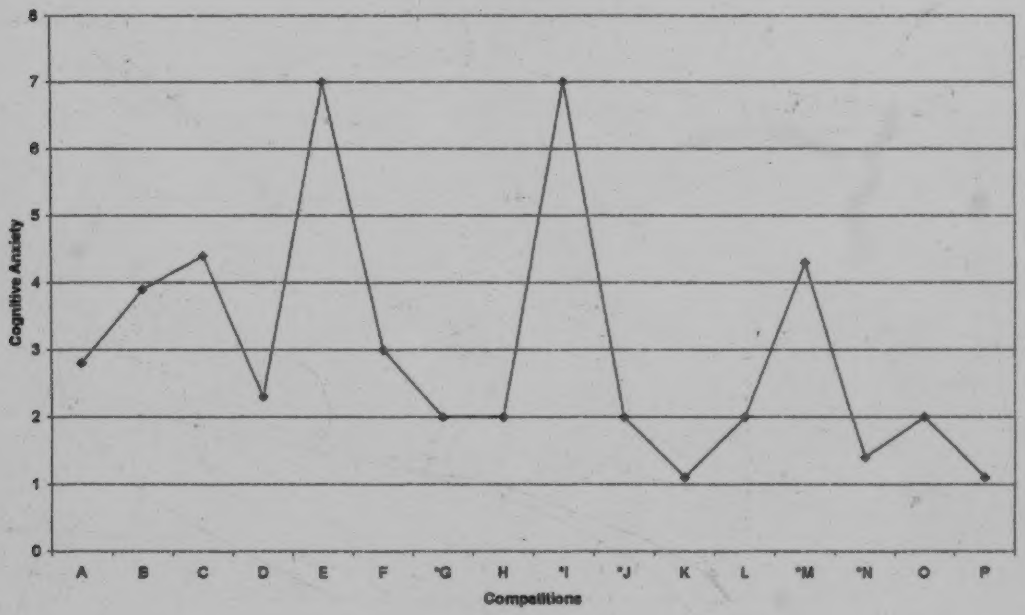
January 27, 2003 February 10, 2003


6.00
5.00
4.00
3.00
2.00
1.00
0.00
General Stress
General Recovery
Sport-Specific Stress
Sport-Specific Recovery
General Stress
Emotional Stress
Social Stress
Conflicts/Pressure
Fatigue
Lack of Energy
Somatic Complaints
Success
Social Relaxation
Somatic Relaxation
General Well-being
Sleep
Disturbed Breaks
Burnout/Emotional Exhaustion
Fitness/Injury
Fitness/Being in Shape
Burnout/Personal Accomplishment
Self-Efficacy
Self-Regulation
Zeitpunkt 3
Zeitpunkt 4
February 10, 2003
March 12, 2003

Appendix U

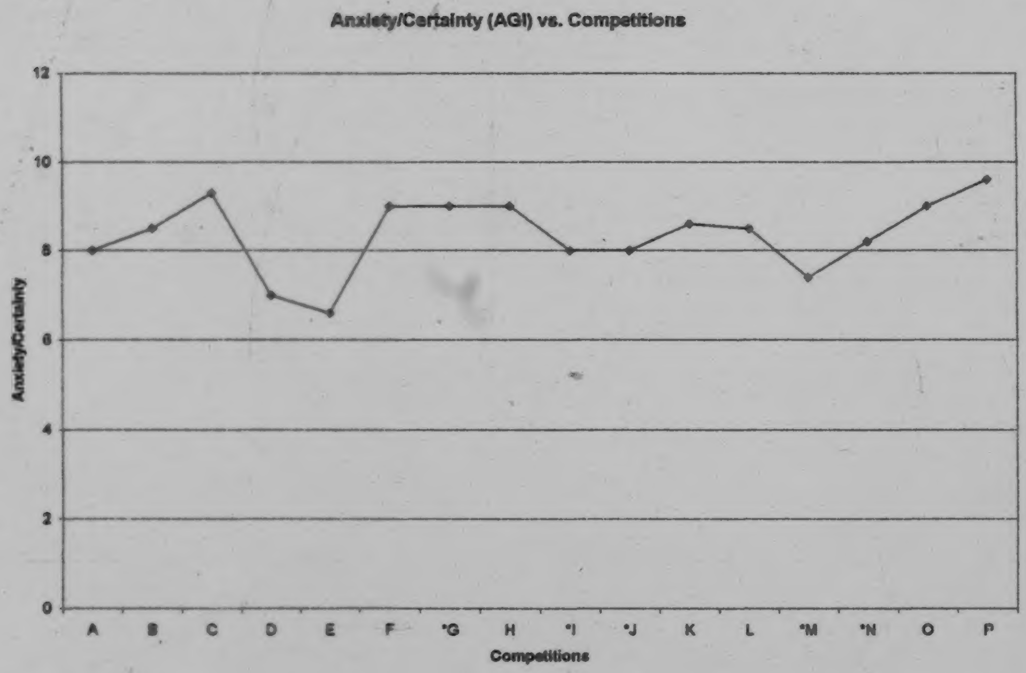

Cognitive Anxiety (CSAI-2) vs. Competitions
25
20
15
10
5
0
Cognitive Anxiety
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

Appendix V

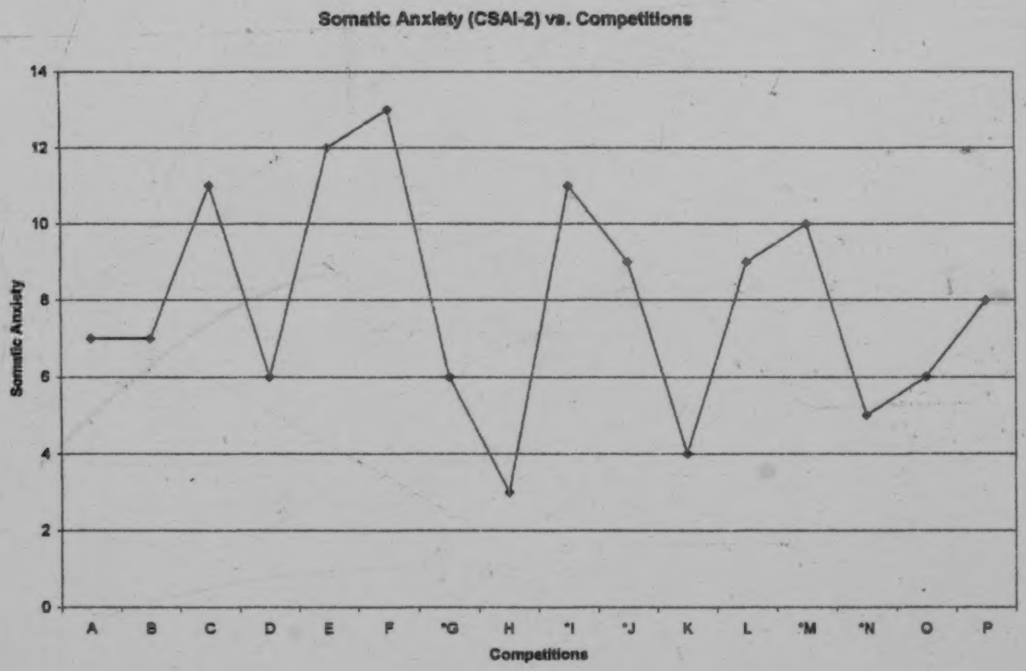


Cognitive Anxiety (MRF) vs. Competitions

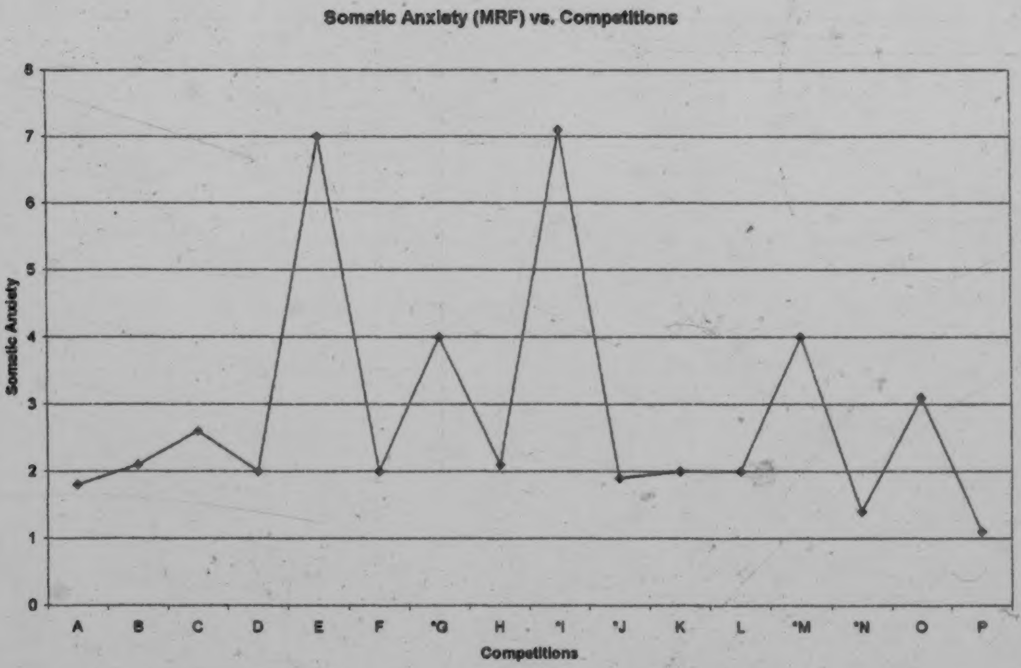
Appendix W


Anxiety/Certainty (AGI) vs. Competitions
12
10
8
6
4
2
0
Anxiety/Certainty
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

Appendix X

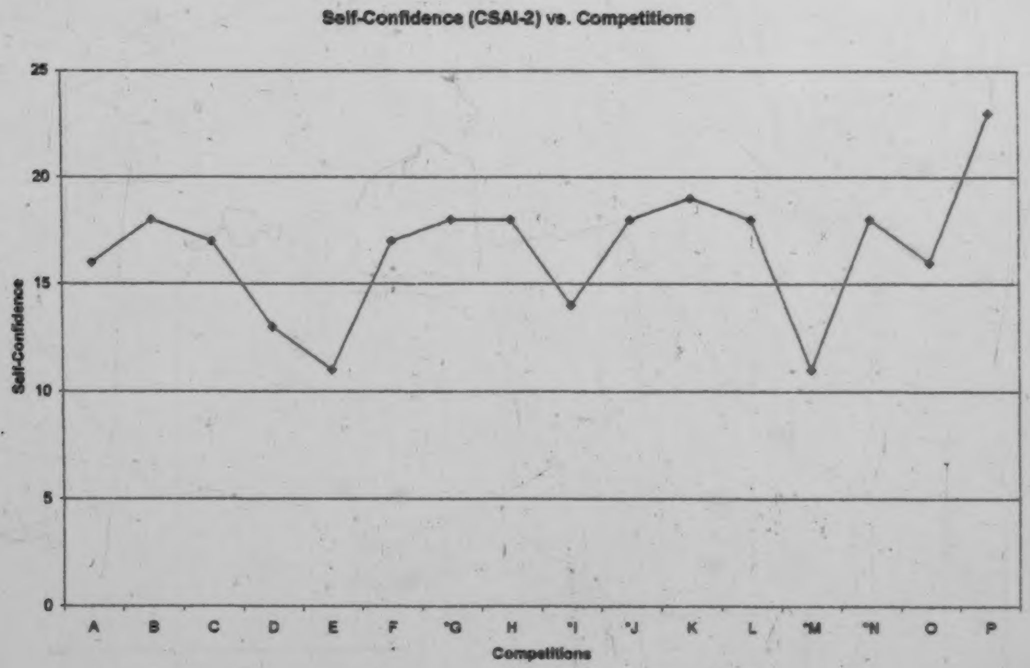

Somatic Anxiety (CSAI-2) vs. Competitions
14
12
10
8
6
4
2
0
Somatic Anxiety
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

Appendix Y

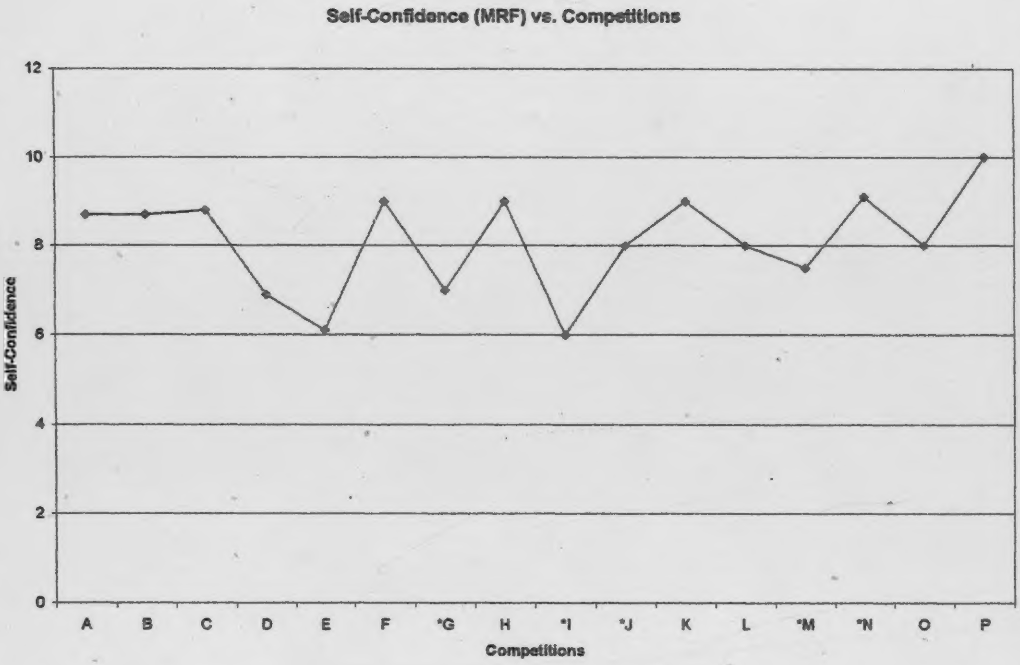


Somatic Anxiety (MRF) vs. Competitions

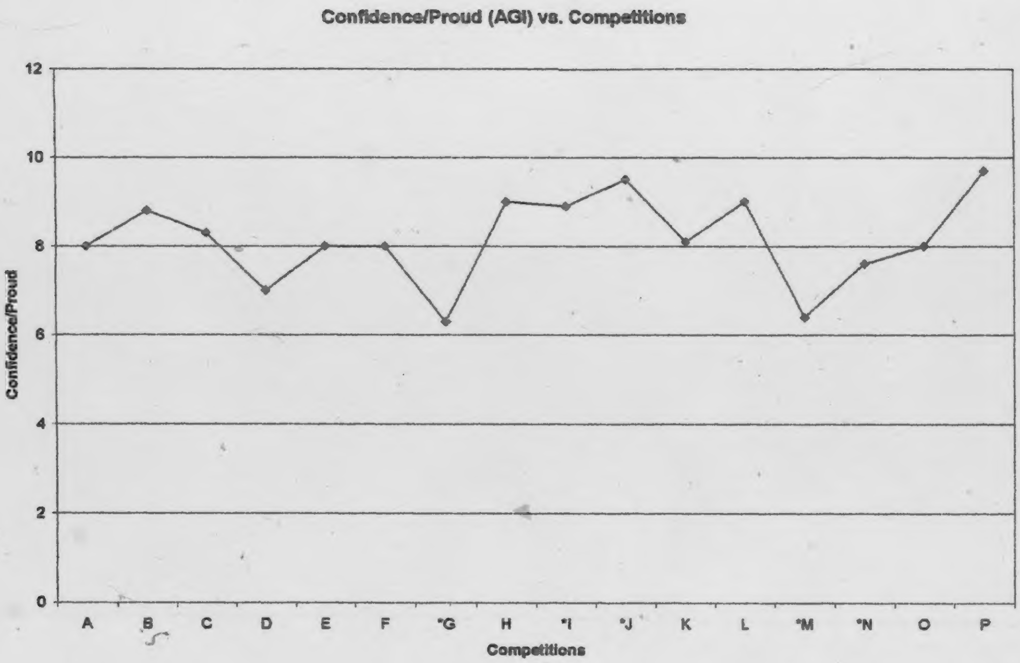
Appendix Z


Self-Confidence (CSAI-2) vs. Competitions
25
20
15
10
5
0
Self-Confidence
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

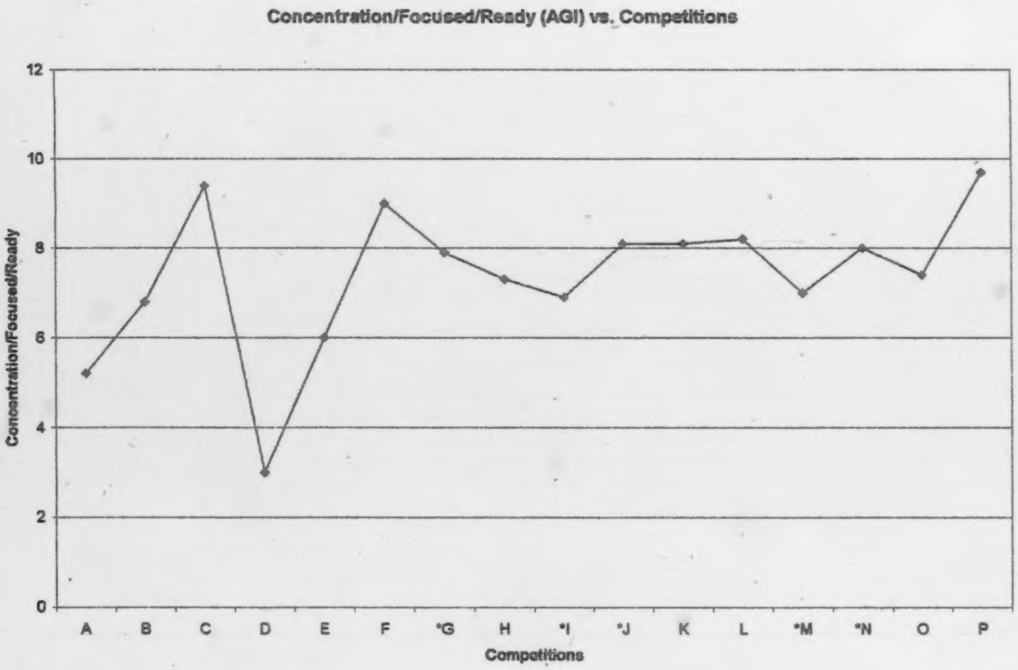
Appendix AA


Self-Confidence (MRF) vs. Competitions
12
10
8
6
4
2
0
Self-Confidence
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

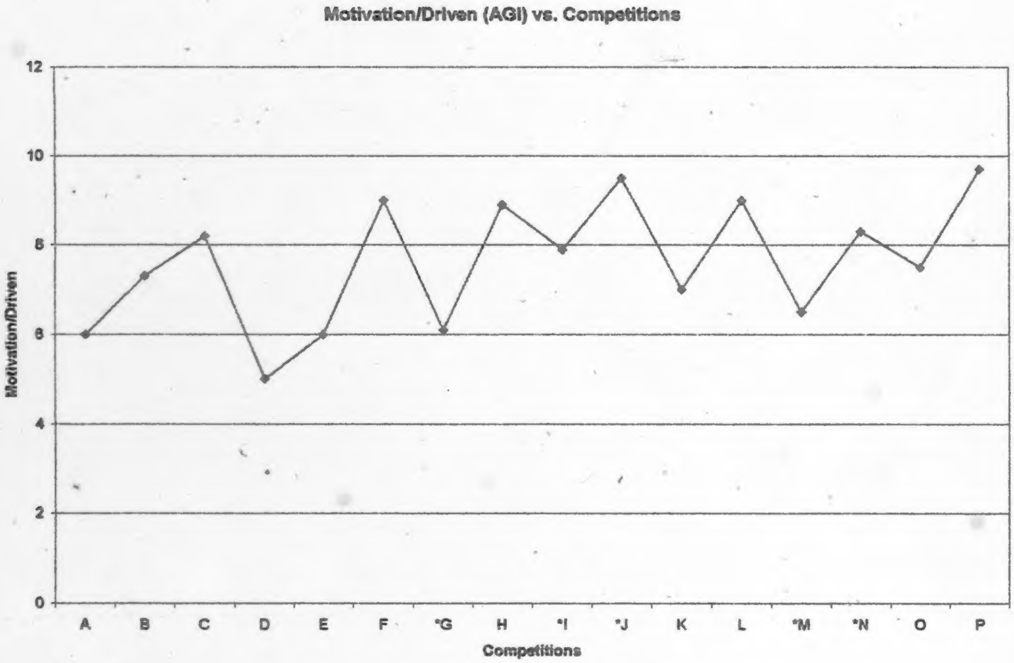
Appendix BB


Confidence/Proud (AGI) vs. Competitions
12
10
8
6
4
2
0
Confidence/Proud
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

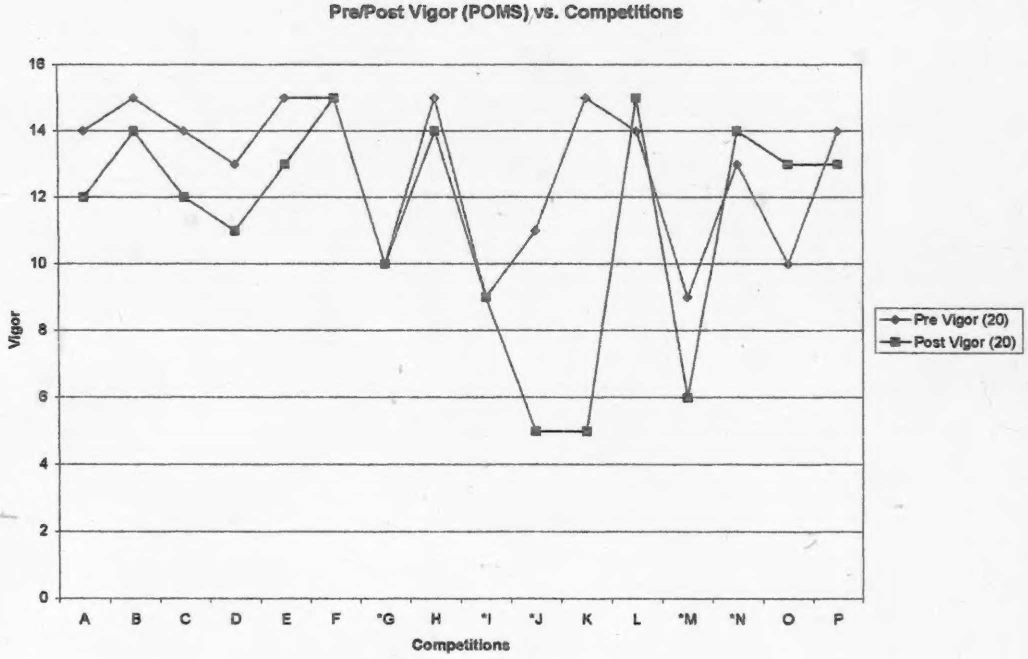
Appendix CC


Concentration/Focused/Ready (AGI) vs. Competitions
Concentration/Focused/Ready
0
2
4
6
8
10
12
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

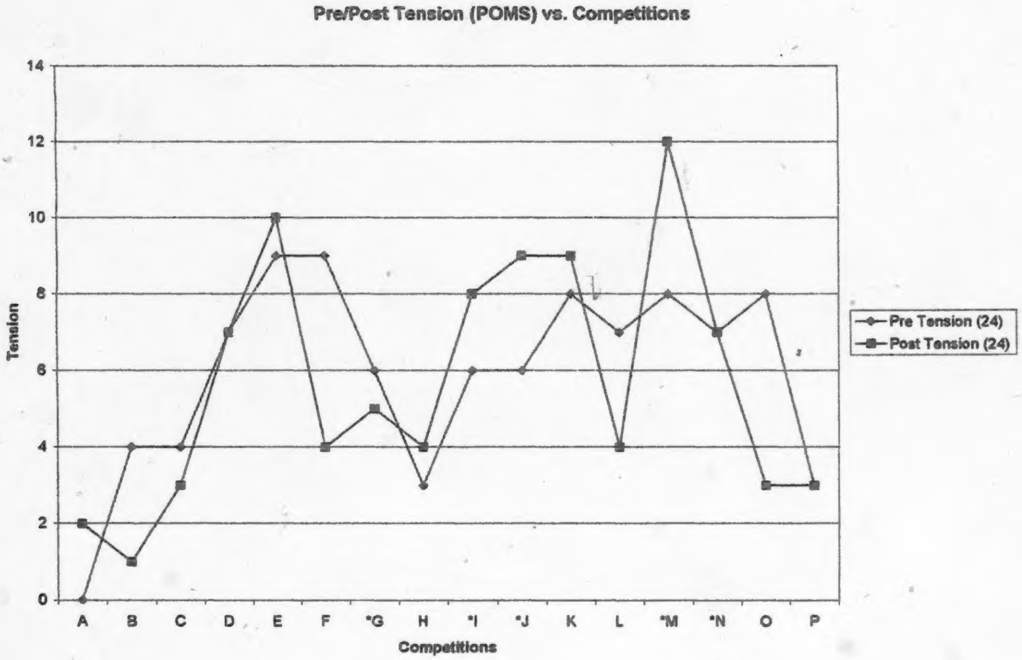
Appendix DD


Motivation/Driven (AGI) vs. Competitions
Motivation/Driven
12
10
8
6
4
2
0
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions

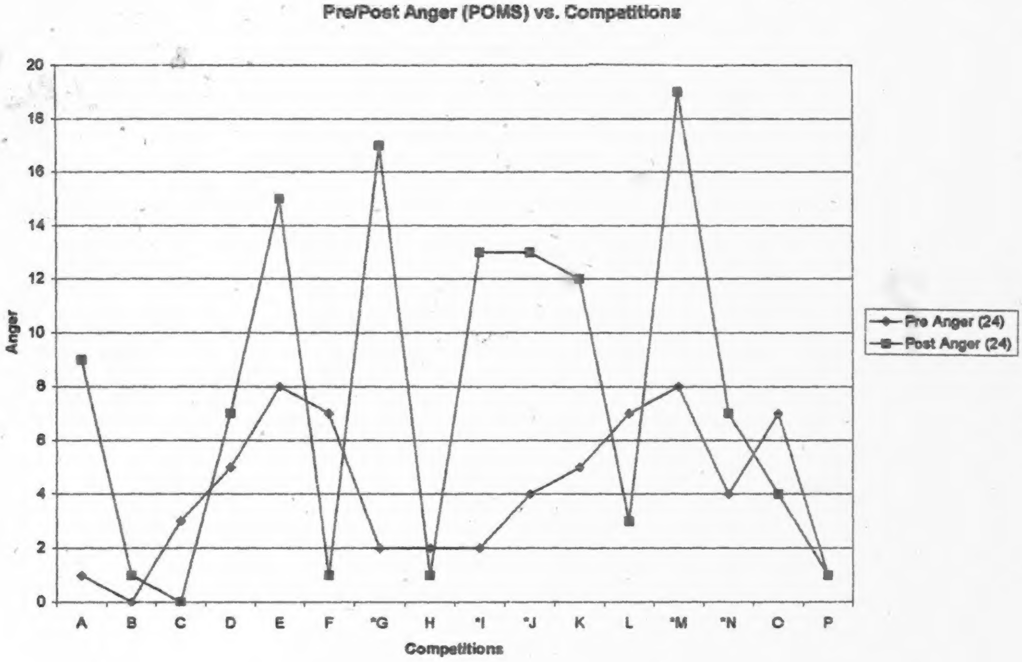
Appendix EE


Pre/Post Vigor (POMS) vs. Competitions
Vigor
16
14
12
10
8
6
4
2
0
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Pre Vigor (20)
Post Vigor (20)

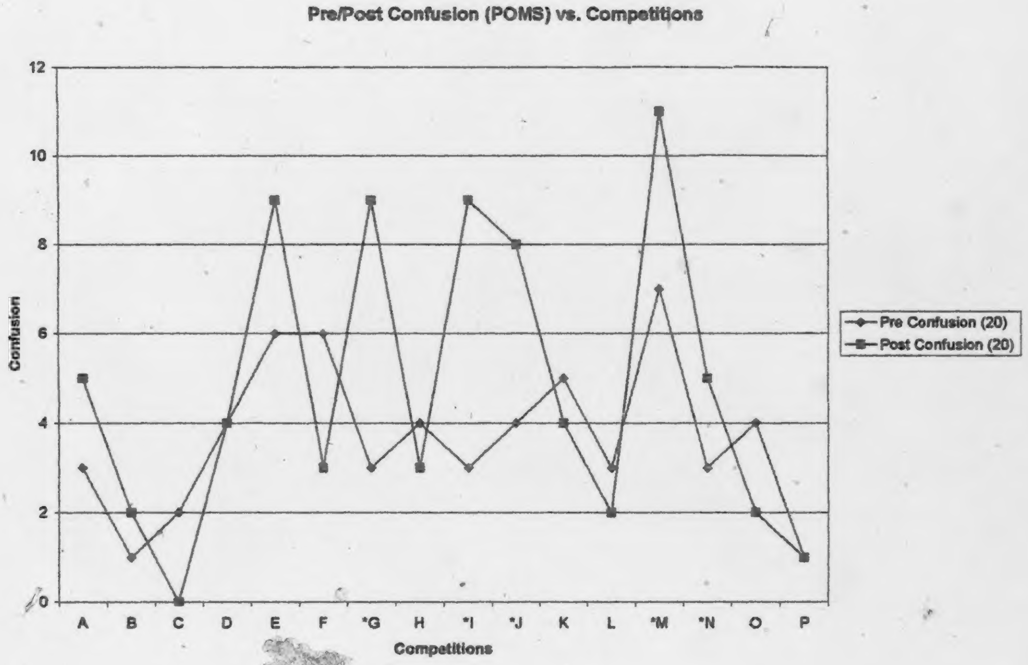
Appendix FF


Pre/Post Tension (POMS) vs. Competitions
Tension
0
2
4
6
8
10
12
14
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Pre Tension (24)
Post Tension (24)

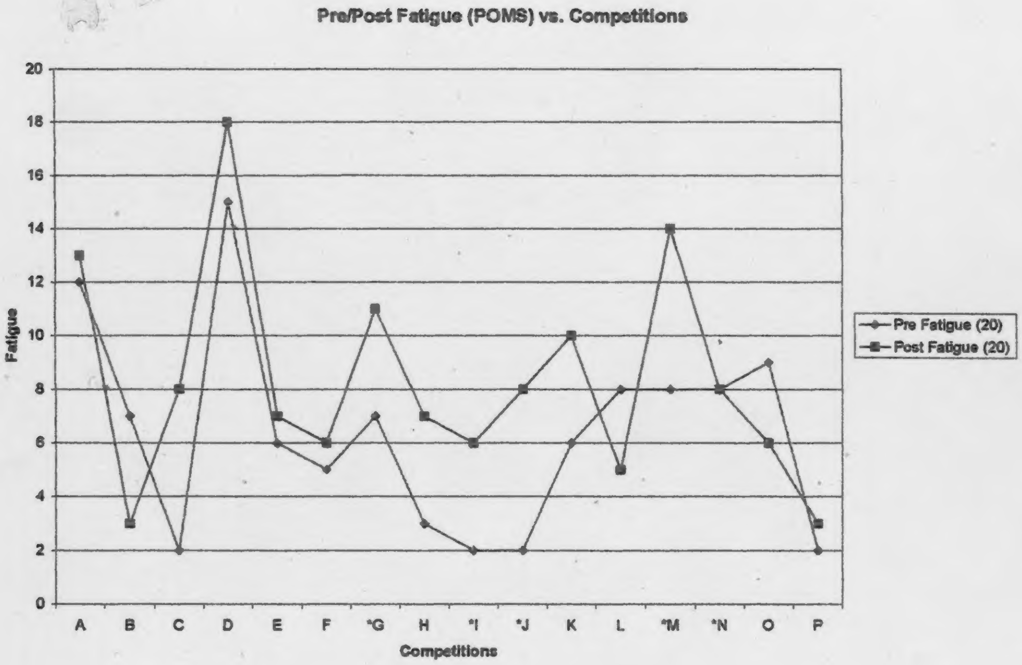
Appendix GG


Pre/Post Anger (POMS) vs. Competitions
20
18
16
14
12
10
8
6
4
2
0
Anger
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Pre Anger (24)
Post Anger (24)

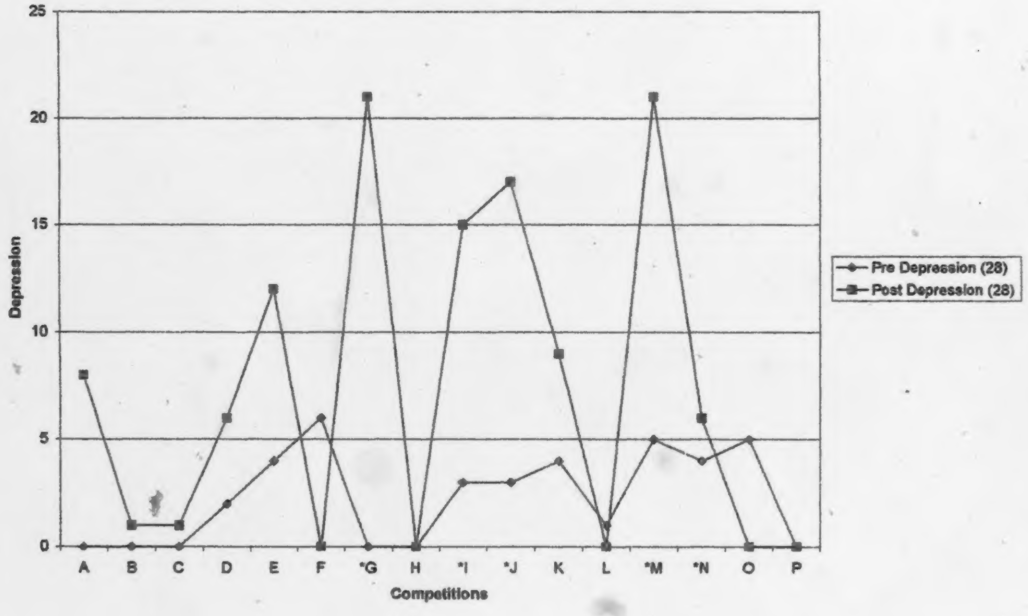
Appendix HH


Pre/Post Confusion (POMS) vs. Competitions
12
10
8
6
4
2
0
Confusion
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Pre Confusion (20)
Post Confusion (20)

Appendix II

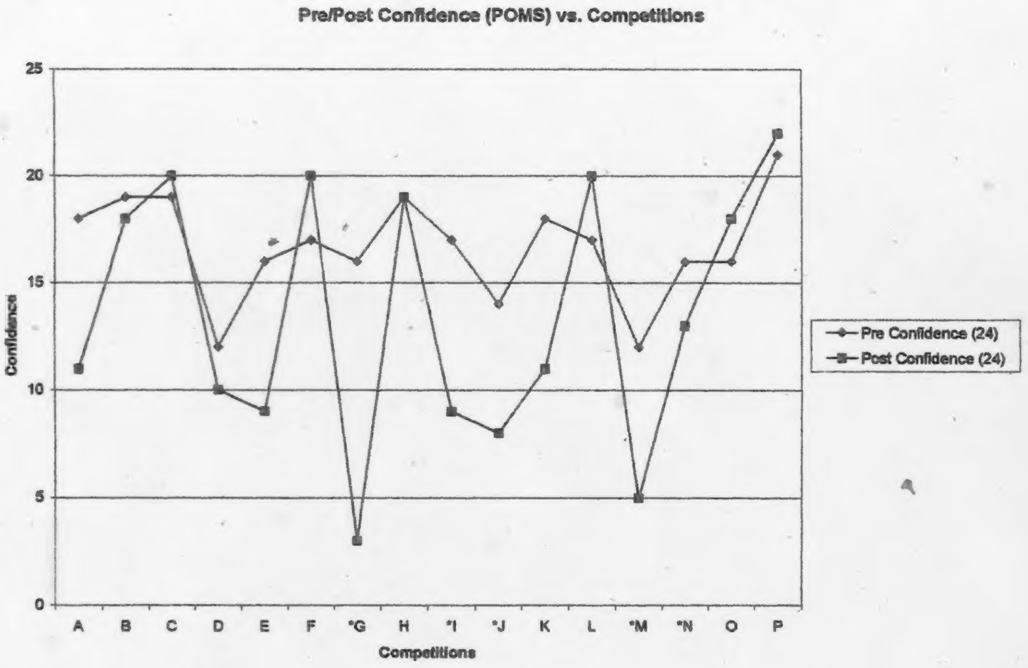

Pre/Post Fatigue (POMS) vs. Competitions
Fatigue
0
2
4
6
8
10
12
14
16
18
20
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Pre Fatigue (20)
Post Fatigue (20)

Appendix JJ

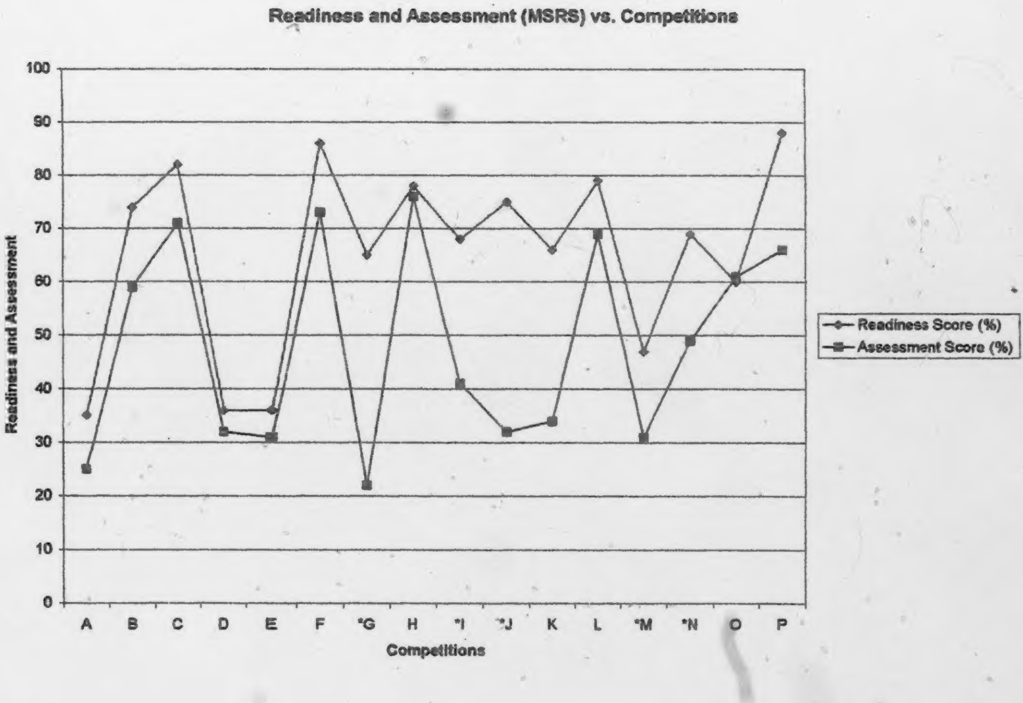


Pre/Post Depression (POMS) vs. Competitions

Appendix KK


Pre/Post Confidence (POMS) vs. Competitions
25
20
15
10
5
0
Confidence
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Pre Confidence (24)
Post Confidence (24)

Appendix LL


Readiness and Assessment (MSRS) vs. Competitions
100
90
80
70
60
50
40
30
20
10
0
Readiness and Assessment
A
B
C
D
E
F
*G
H
*I
*J
K
L
*M
*N
O
P
Competitions
Readiness Score (%)
Assessment Score (%)